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VOL. 49 DECEMBER, 1923 No. 250

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CONTENTS

Farragut.—Goodrich 1961
Bombing Tests on the "Virginia" and "New Jersey."—Grow . 1987
For the Want of a Wrinkle a Ship Was Lost.—Lackey . . . 1997
Selection and Graded Retirement.—Doyle 1999
Taking the Navy to the People.—Wharton 2010
The Trend in Small Arms.—Wilson 2022
Back to Normalcy with Amalgamation.—Smith 2030
Co-ordinators—Who? What? Why?—Russell 2035
The Average Naval Officer—An Estimate.—Armknecht . . 2040
Discussion 2048
Professional Notes 2053
Notes on International Affairs 2120
Review of Books 2128
Minutes of Annual Meeting, 1923 2129
Secretary's Notes 2137
Index to Vol. 49 2141

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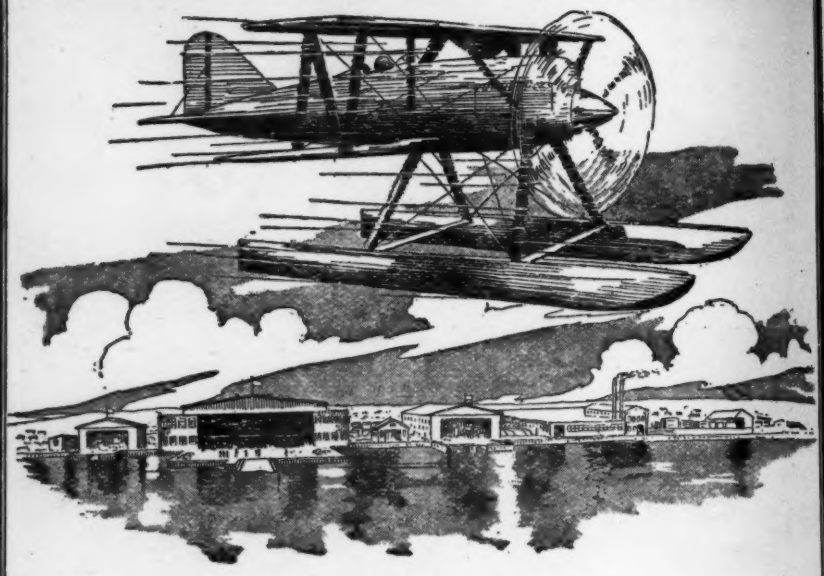

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VOL. NO. 49, NO. 12 DECEMBER, 1923 WHOLE NO. 250

Contents

FARRAGUT. By Rear Admiral Caspar F. Goodrich, U. S. Navy, Retired 1961
BOMBING TESTS ON THE "VIRGINIA" AND "NEW JERSEY." By Lieutenant Commander H. B. Grow, U. S. Navy.... 1987
FOR THE WANT OF A WRINKLE A SHIP WAS LOST. By Captain H. E. Lackey, U. S. Navy..... 1997
SELECTION AND GRADED RETIREMENT. By Lieutenant Walter E. Doyle, U. S. Navy..... 1999
TAKING THE NAVY TO THE PEOPLE. By Lieutenant (jg) Wallace S. Wharton, U. S. N. R. F..... 2010
THE TREND IN SMALL ARMS. By Lieutenant Commander E. E. Wilson, U. S. Navy..... 2022
BACK TO NORMALCY WITH AMALGAMATION. By Lieutenant Commander Oscar Smith, U. S. Navy..... 2030
CO-ORDINATORS—WHO? WHAT? WHY? By Commander Charles F. Russell, U. S. Navy..... 2035
THE AVERAGE NAVAL OFFICER. By Ensign Richard F. Armknecht, U. S. Navy..... 2040
DISCUSSION 2048
PROFESSIONAL NOTES 2053
NOTES ON INTERNATIONAL AFFAIRS..... 2120
REVIEW OF BOOKS..... 2128
MINUTES OF ANNUAL MEETING, 1923..... 2129
SECRETARY'S NOTES..... 2137
INDEX TO VOL. 49..... 2141

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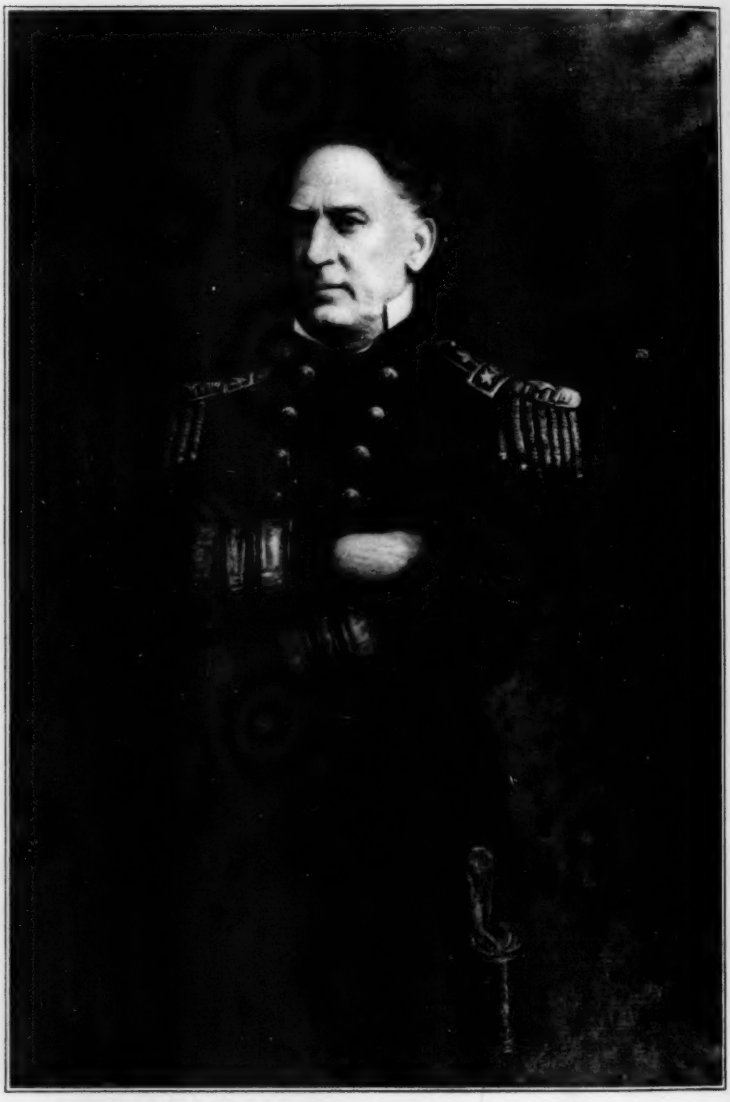

DAVID GLASGOW FARRAGUT, ADMIRAL, U. S. NAVY
From a painting by N. M. Miller, now in Memorial Hall,
U. S. Naval Academy

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

VOL. NO. 49, NO. 12 DECEMBER, 1923 WHOLE NO. 250

FARRAGUT

BY REAR ADMIRAL CASPAR F. GOODRICH, U. S. NAVY, Retired

EDITOR'S NOTE: In submitting this article to the Institute, Admiral Goodrich states:

> "We cannot do adequate justice to Farragut's fame, but we owe it to ourselves to keep his memory green. Surely every graduate ought to have in his kit the story of our Navy's greatest man."

In this brief biography, there are presented not only the essential facts of Admiral Farragut's life, but also many of the interesting details so necessary to complete the picture. Admiral Farragut's fame rests, not upon a single incident, but upon his whole career. He has given us an example of outstanding courage in the face of danger—of inflexible determination and will power in the face of difficulty—of the brilliant and polished naval officer, both in junior ranks, and in the highest office in the Navy—of the man loved and respected alike by all who knew him.

Other great men in history have had some of the foregoing characteristics; few indeed are there who have had them all. The example which he furnished, both of the officer and of the man, may well serve for emulation by future naval officers, through the years to come.

STUDENTS of Naval History are substantially agreed that the greatest of all naval commanders was the British Admiral, Lord Nelson; but when asked to name the second person in this honorable hierarchy their choice is not unlikely to be dictated by their own nationality. A Frenchman would naturally feel it incumbent on him to claim this distinction for le Bailli de Suffren; a Spaniard for the Marquis of Santa Cruz; a Genoese for Andrea Doria; an Austrian for Tegethoff, etc., and each would battle loyally for the glory of his own country and

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his own countryman. It is not to be wondered at that Americans, in their turn, should present a candidate for this high distinction; since the American Colonies, which fought for independence during the eighteenth century and, becoming later the United States were, until the middle of the last century, essentially maritime in their development. Carrying on most of their trade on the water, they were not infrequently embroiled in hostilities with other powers. Hence they produced a long list of gallant sailors, any one of whom might have stood worthily beside the men already named.

Such was the training of him of whom I am privileged to write this brief sketch, a training that proved its value in the stern test of the fratricidal struggle from 1861 to '65, which had nearly rent in twain the United States of America, whose salvation from disruption was materially aided by his far-sighted strategy and capable tactics.

To appreciate what he accomplished it is necessary to touch briefiy upon the causes and course of what is known as the Civil War in America. Without going too deeply into the subject, it may be well to point out that the southern states, those south of the parallel of forty degrees north latitude, for reasons sufficient to themselves, determined in 1861 to secede from the Union. As this action on their part would probably have been followed by a breaking up of the whole country into small independent and warring republics, the remaining states opposed so disintegrating a movement and declared that they would prevent it if necessary by force to the utmost. Thereupon followed a long and bloody war, in which the North, which stood for the preservation of the Union, finally triumphed. Many southerners today, looking back upon this terrible contest, realize that it is far better for them and for the South in general, that their cause should have been lost.

A glance at the map of the United States, with especial reference to the southern portion, will show that the latter had a coast line about 2,000 geographical miles in length. Now the states which seceded to form the "Confederate States of America" were agricultural, their industries being almost negligible. It is evident then, that to carry on a war, it was necessary that their armies should receive from oversea clothing, arms, munitions, etc., in short practically everything except food, since there was no time,

nor indeed was there any disposition to establish such manufactures within the Confederacy's borders. On the other hand, this condition of affairs compelled the North to establish and maintain a close blockade to keep those supplies out of the besieged area and to prevent the export of cotton, the sole means by which the South could pay its bills in Europe. This, the first of three military propositions, proved in the end to be the most extensive and effective blockade in all history.

Again glancing at the map, it will be perceived that the great Mississippi River divides the southern states, or as they chose to call themselves, the "Southern Confederacy," in two. West of this mighty river was a large district furnishing corn, cotton, beef and other indispensable products. Hence it was in the highest degree desirable for the Union forces to seize and hold the course of that stream. This operation was the second of the three military propositions.

The third and last was simply the overwhelming of the Confederate armies in the field; the crown, so to speak, of the edifice of war's purposes. It was with the second of these propositions that Farragut was chiefly identified but he had his full share of responsibility under the first as well.

Admiral Farragut was born in the South and it is to be presumed that his sympathies were with his own people, yet he held his country, viewed as a whole, as better and more important than any particular section, and like a number of other southerners, he remained loyal to the flag. He was selected, and very rightly, to conduct the operations on the southern shore of the Confederate States, and in so doing to have the largest individual share in the fighting carried on by the American Navy during this war. To him went victories which were not only most gallant in themselves, but of far-reaching importance. Before describing these notable naval actions, distinguished no less by the hard fighting and exceptional skill which characterized them than by the great personal courage manifested by Admiral Farragut, let us endeavor to trace in his antecedents the reasons why he responded so splendidly to the demands made upon him at the crisis of his career.

Farragut's case may well be cited to prove the validity of the contention that genius is hereditary—since he came of a fighting race.

He was descended from the renowned Don Pedro Ferragut, who served under James I, King of Aragon, styled in history El Conquistador, in the campaigns which resulted in the expulsion of the Moors from Majorca in 1229, and from Valencia in 1238. In Majorca, Don Pedro was Sergeant before the King—an office of high honor and importance, held only by those of noble blood. James bestowed estates upon the knights who accompanied him in these enterprises, and directed the troubadour Mossen Jaime Febrer to celebrate them in verse. The following is the stanza devoted to Pedro Ferragut:

Sobre camp bermell una ferradura
De finisim or, ab un clau daurat,
Pere Ferragut pinta, é en tal figura
Esplica lo agnom. La historia asegura
Ser aragones, de Jaca baixat.
Apres que en Mallorca servi de sargent,
Venint á Valencia, hon gran renom guanya
De expert capitá per lo dilitgent;
Los anys, é sucesos lo feren prudent.
Té en lo pelear gran cordura é manya,
*Pergue á totes armes fácilment se apanya.**

The Ferragut family lived in the Island of Majorca, to the records of which it contributed many names of distinction. Of Councillors of the Kingdom of Majorca it furnished not a few—as it also did of magistrates of the City of Palma and Kingdom of Majorca. Captain Antonio Ferragut fought heroically in the wars of Philip IV; Gonzalo, celebrated for his learning, became Bishop of Urgel and Yoiza. Our Admiral's lineage shows at every stage the same qualities as those by which he was characterized, courage, force, intellectuality, a high sense of honor and duty.

In his grandfather's time the spelling of the name seems to have changed from Ferragut to Farragut.

George Farragut, father of the Admiral, was sent to school at Barcelona, but was seized with the spirit of adventure, and emigrated to America at an early age.

He arrived in 1776, promptly sided with the colonists, and served gallantly in their struggle for independence.

He settled in Tennessee where, at Campbell's Station near Knoxville, the subject of this sketch was born on July 5, 1801.

*The quotations in this sketch are from his son's *Life and Letters of Admiral Farragut.*

That his mother as well as his father came of fighting stock, can be seen in this abstract from his journal:

In those days, on the border, we were continually annoyed by the Indians, which rendered the organization of the militia a public necessity. My father was appointed a major of cavalry, and served for some time in that capacity; the condition of the country requiring its inhabitants to be constantly on the outlook. I remember that on one occasion, during my father's absence, a party of Indians came to our house, which was somewhat isolated, when my mother, who was a brave and energetic woman, barred the door in the most effectual manner, and sent all of us trembling little ones up into the loft of the barn, while she guarded the entrance with an axe. The savages attempted to parley with her, but she kept them at bay, until finally they departed, for some reason which is unknown, their intentions having been evidently hostile. My father arrived shortly after with his command, and immediately pursued the Indians, whom, I believe, he succeeded in overtaking and punishing; at any rate, they were never seen again in that part of the country.

Shortly after this episode the family moved to Louisiana and settled in New Orleans. Here it was that occurred an event which was destined to shape the whole of Farragut's career. In his own words:

It so happened that the father of Commodore Porter was serving on the New Orleans Naval Station with my father. He was taken sick, and my father, hearing of it, had him brought to our house, where, after a severe illness, during which he was nursed by my mother, he died. This, as well as I can remember, occurred in 1809. I mention this kind act on the part of my parents because it is to this circumstance that I am indebted for my present rank in the Navy of the United States. Not long after his father's death, Commander David Porter took command of the Naval Station at New Orleans, and having heard that his father died at our house, and had received some attention from my parents, he determined to visit us and adopt such one of the children as desired to go with him. He accordingly came to see us, and after a while the question of adoption was put to us all, when I, being inspired by his uniform and that of my brother William, who had received an appointment in the Navy some time before, said promptly that I would go. This was after my mother's death. I returned with Commander Porter to New Orleans, where I met Mrs. Porter for the first time. Thus commenced my acquaintance with the celebrated Commodore David Porter late of the United States Navy, and I am happy to have it in my power to say, with feelings of the warmest gratitude, that he ever was to me all that he had promised, my "friend and guardian."

Porter from this date onward stood toward young David *in loco parentis*. He took David to Washington and later to Chester,

a short distance below Philadelphia on the Delaware River, caring for the boy in his own family as if he were a son and sending him to school. Due to Porter's standing with the then Secretary of the Navy, Farragut was given, when only nine years and five months old, a warrant as Midshipman in the Navy of the United States.

This appointment was at first merely honorary but when Porter was placed in command of the U. S. S. *Essex,* in August, 1811, Farragut joined him, beginning his actual service afloat at the tender age of ten years and one month, by cruising in squadron along the American coast until Christmas, when his ship went into winter quarters and he to school at Newport, R. I.

In June, 1812, war broke out between England and the United States. For the most part it was a naval war, thus serving as an advanced and practical school in his profession to this mere boy. Then followed nineteen months of absorbing interest which can be touched upon but briefly. Lack of space forbids.

In the early days of her cruise the *Essex* captured off Newfoundland the English sloop-of-war *Alert* and a number of other prizes. An attempted uprising of prisoners was frustrated to a notable degree by the coolness and presence of mind of young Farragut, who tells the story in his journal.

> It was the habit of Captain Porter to sound the alarm of fire at all hours of the night; sometimes he would have a smoke created in the main hold. This was for the purpose of testing the nerves of the crew, and preparing them for an emergency. Whenever this alarm was given, every man repaired promptly to his quarters with his cutlass and blanket, to await the orders of the commander. At the commencement of this system, a little confusion would sometimes occur, but delinquents were promptly punished, and in a short time the cry of "Fire!" did not affect the steadiness of the men; on the contrary, the greatest alacrity was manifested throughout the ship on hearing the alarm, and application of the system on the occasion I am about to relate was singularly effective.
>
> While the ship was crowded with prisoners they planned a mutiny. The coxswain of the captain's gig of the *Alert,* who was a leader in the affair, came to my hammock with a pistol in his hand, and stood by it, gazing intently upon me. Seeing a man thus armed, and recognizing him as a prisoner, I knew there must be something wrong, and, probably from fear more than anything else, I remained perfectly motionless until he passed. Then, slipping from my hammock, I crept noiselessly to the cabin and informed Captain Porter of what I had seen. He sprang from his cot, was on the berth deck in an instant, and immediately cried "Fire!"

The effect was wonderful. Instead of attempting to strike the fatal blow, the prisoners, or mutineers, became alarmed and confused, nor did they recover from their stupor until they heard the boarders called to the main hatch by the Captain, whom they now saw for the first time in their midst, to secure them.

In the autumn of 1812, Captain Porter, with the *Essex*, with great boldness headed for the South Pacific. In "weathering Cape Horn," Midshipman Farragut learned for the first time how violent a gale of wind might become and how a sailing vessel should be handled with all her weather ports knocked in and her boats washed away by the terrific seas. A hard school, to be sure, but very effective in its results. From this time on, Farragut was a real sailor.

Captain Porter's object was to destroy the English whaling industry in the Pacific. For a while he had things his own way and captured many English whalers, sending them home with prize crews under officers of the *Essex* detailed as "prize masters." So reduced was his own complement that he had at last to give the command of one prize, the *Barclay*, to young Farragut, then only twelve years of age! Of this unprecedented responsibility the boy acquitted himself with complete credit. If naval history records any instance of so young a captain, I have failed to note it.

It is well understood that one learns best in actually doing. Poets may be born but artisans are made. Each must acquire his trade by practice. The art of command is no exception to this rule. Moreover, like other callings, the younger one is when commencing one's instruction, the more rapidly is proficiency reached. Is it then any wonder that Farragut, who had his first command before he was thirteen years old, should have developed into one of the world's greatest leaders? However clever a pupil may be, much depends upon the school he attends and the ability of his preceptor. In these respects, Farragut was exceptionally fortunate. On these points his son later says:

It will be seen that Farragut was an apt scholar in the profession he had chosen, observant and appreciative; nor did he fail through life to give, on all occasions, the highest credit to his "friend and guardian," Commodore Porter, for the rare ability and resplendent heroism which distinguished that great naval commander. It was fortunate for himself, for the service, the good of which he labored so earnestly always to

promote, and for his country, that the young sailor was trained in a school so admirably adapted to develop his character and shape his career. Those who knew him best and watched his course with most interest, all testify to that thorough knowledge of his profession, readiness of resource, and untiring devotion to his duties in their minutest details, the foundation of which was the wholesome discipline of his earliest service and the illustrious example of his preceptor in the art of naval warfare.

Although Farragut earlier in this cruise had had experience in actions with the enemy, these affairs were but trivial in comparison with the battle which ended the career of the *Essex* and made him a prisoner in English hands. On March 28, 1814, a sudden squall of wind carried away the *Essex's* maintopmast and drove her, disabled, into a small cove just outside of Valparaiso, where she was attacked by two English men-of-war, the frigate *Phoebe* and the sloop-of-war *Cherub*. The *Essex's* main battery was of carronades, short range guns and powerless to reply to the long eighteen-pounders of the frigate, which, warily, kept out of reach of the *Essex's* carronades and minded but little such light twelve-pound projectiles as came from her six "long twelves." After a gallant and unequal engagement of three hours' duration the *Essex,* sinking and on fire, was obliged to haul down her colors. The heavy casualty list speaks volumes for the intensity of the battle: Out of a crew of 255, fifty-eight were killed, sixty-six wounded, thirty-one missing (probably drowned). In few naval actions has the loss reached the high figure of sixty per cent.

Of Farragut's part he says:

During the action I was like "Paddy in the cat-harpins," a man on occasions. I performed the duties of Captain's aid, quarter-gunner, powder-boy, and in fact did everything that was required of me. I shall never forget the horrid impression made upon me at the sight of the first man I had ever seen killed. He was a boatswain's mate, and was fearfully mutilated. It staggered and sickened me at first; but they soon began to fall around me so fast that it all appeared like a dream, and produced no effect on my nerves. I can remember well, while I was standing near the Captain, just abaft the mainmast, a shot came through the waterways and glanced upward, killing four men who were standing by the side of the gun, taking the last one in the head and scattering his brains over both of us. But this awful sight did not effect me half as much as the death of the first poor fellow. I neither thought of nor noticed anything but the working of the guns.

Soon after this, some gun-primers were wanted, and I was sent after them. In going below, while I was on the ward-room ladder, the Captain

of the gun directly opposite the hatchway was struck full in the face by an eighteen-pound shot, and fell back on me. We tumbled down the hatch together. I struck on my head, and fortunately, he fell on my hips. I say fortunately for, as he was a man of at least two hundred pounds' weight, I would have been crushed to death if he had fallen directly across my body. I lay for some moments stunned by the blow, but soon recovered consciousness enough to rush up on deck. The Captain, seeing me covered with blood, asked if I was wounded, to which I replied, "I believe not, sir." "Then," said he, "where are the primers?" This first brought me completely to my senses, and I ran below again and carried the primers on deck. When I came up the second time I saw the Captain fall, and in my turn ran up and asked if he was wounded. He answered me almost in the same words, "I believe not, my son; but I felt a blow on the top of my head." He must have been knocked down by the windage of a passing shot, as his hat was somewhat damaged.

When my services were not required for other purposes, I generally assisted in working a gun; would run and bring powder from the boys, and send them back for more, until the Captain wanted me to carry a message; and this continued to employ me during the action.

I have already remarked how soon I became accustomed to scenes of blood and death during the action; but after the battle had ceased, when, on going below, I saw the mangled bodies of my shipmates, dead and dying, groaning and expiring with the most patriotic sentiments on their lips, I became faint and sick; my sympathies were all aroused. As soon as I recovered from the first shock, however, I hastened to assist the surgeon in staunching and dressing the wounds of my comrades.

I went on board the *Phoebe* about 8 A. M. on the morning of the twenty-ninth, and was ushered into the steerage. I was so mortified at our capture that I could not refrain from tears. While in this uncomfortable state, I was aroused by hearing a young reefer call out:

"A prize! a prize! Ho, boys, a fine grunter, by Jove!" I saw at once that he had under his arm a pet pig belonging to our ship, called "Murphy." I claimed the animal as my own.

"Ah," said he, "but you are a prisoner, and your pig also."

"We always respect private property," I replied, and as I had seized hold of Murphy, I determined not to let go, unless "compelled by superior force." This was fun for the oldsters, who immediately sung out:

"Go it, my little Yankee! If you can thrash Shorty, you shall have your pig."

"Agreed!" said I.

A ring was formed in the open space, and at it we went. I soon found that my antagonist's pugilistic education did not come up to mine. In fact, he was no match for me, and was compelled to give up the pig. So I took master Murphy under my arm, feeling that I had, in some degree, wiped out the disgrace of our defeat.

We were all soon put on parole, and went on shore; our wounded from the ship being moved to a comfortable house hired for their accommodation. I volunteered my aid to our surgeon as an assistant, and I never earned Uncle Sam's money so faithfully as I did during that hospital service. I rose at daylight and arranged the bandages and plasters until 8 A. M.; then, after breakfast, I went to work at my patients.

We were all put on parole until regularly exchanged or peace should be concluded. The *Essex Junior* was sold. Thus ended one of the most eventful cruises of my life.

In company with the other survivors, Farragut was sent to New York in a cartel.

Again we find him in Porter's home at Chester. There he attended school until regularly exchanged when he was sent to sea, cruising chiefly in the Mediterranean. As bearing upon his strength of character, brief allusion may be made to an association on board the *John Adams* with some dissolute messmates, the evil effects of which, however, he was soon able to eradicate.

Never having had any real love for dissipation, I easily got rid of the bad influences which had assailed me in that ship.

A prolonged voyage in European waters was of marked educational value. Not only did he grow proficient in his chosen profession but he familiarized himself with the ports, people, monuments, arts, and to a certain extent, languages of the Mediterranean. The chaplain of his ship, the *Washington,* had conceived so high an opinion of young Farragut that in 1817, when appointed American Consul at Tunis, he asked that Farragut might "be permitted to reside with me during the (coming) winter at Tunis, and pursue his education under my care."

Needless to say, such an opportunity under sympathetic and competent guidance was of inestimable importance to this midshipman of whom his preceptor had formed a flattering opinion and for whom he augured a brilliant future.

"I resided," said Farragut, "in Tunis for nine months, pursuing my studies under Mr. Folsom. I studied French, Italian, English literature, and mathematics." Nowhere does he mention the fact, which came quite casually to my own notice, that to his other accomplishments he had added the very rare one of ability to speak Arabic. Later on he added the art of carpentry,

learned while caring for his sick wife. It is hardly necessary to state that Farragut repaid Consul Folsom's interest and affection by a lifelong devotion.

In the spring of 1819, he was appointed an acting lieutenant. Speaking of his early advancement he remarks that "I consider it a great advantage to obtain command young, having observed as a general thing, that persons who come into authority late in life shrink from responsibility, and often break down under its weight."

On his way home in a merchant vessel after this cruise, a Columbian brig-of-war which hove in sight was taken for a pirate by the panic stricken captain. It must be remembered that, in those days pirates were to be encountered on every sea. Although Farragut had only two invalided bluejackets to rely upon, he relieved the captain, took charge of the ship, and persuaded the crew to fight if necessary. Fortunately the strange vessel proved friendly, rather than hostile. Of this incident Farragut's son says:

> When we consider that it was a boy of eighteen, orphaned at an early age, and thrown upon his own resources, who accomplished this feat of assuming command of a vessel in which he was a passenger, infusing a martial spirit into the crew of a merchantman in actual contemplation of an immediate battle, and preparing for a skilful and gallant defense against a supposed pirate, we can then see that the Admiral of after years was not made such in a day, or by the mere exigencies of the Civil War, but was born for it and trained for it through a long experience.

For a number of years succeeding this episode, Farragut's duty lay in the Gulf of Mexico, an unconscious preparation for the crowning incidents of his career through the familiarity he acquired with its waters, its climate, and its shores. In an attack on some pirates at Cape Cruz, Cuba, in 1823, he behaved with gallantry although the affair meets with scant treatment in his journal,—so great was his modesty.

In 1826 he enjoyed and utilized an opportunity to show his interest in youths, an interest by which I myself profited forty years later. Being attached to the "Receiving Ship" at Norfolk, Va., he "established a school for the boys, who with very few exceptions did not know their letters. They were thirty-seven in number, and had made such progress as to elicit one of the

few, the very few, compliments I ever received from the Navy Department or its head."

In 1832-33 Farragut was the "First Lieutenant," or second in command of the *Natchez,* and as such charged with the execution of the captain's orders. The influence of this officer upon the morale of the ship's company is so great that it may almost be said that as the first lieutenant so is the ship. An officer who sailed with Farragut on board the *Natchez* says:

> Never was the crew of a man-of-war better disciplined, or more contented and happy. The moment all hands were called and Farragut took the trumpet, every man under him was alive and eager for duty. I remember well one occasion when he took the *Natchez* out of the harbor of Rio, which at the entrance is quite narrow, against a head wind, by a maneuver termed at that day, "box hauling." There were several foreign men-of-war in port, English and French, whose officers and crews were watching us closely. Many declared that the maneuver could not be successfully accomplished; but it was done splendidly, without a balk or failure, and I shall remember to my dying day the glow of pride and satisfaction which we all felt.

He was now to enjoy a new experience in war although as spectator rather than participant. Being given command of the sloop-of-war *Erie* in August, 1838, and sent again into the Gulf of Mexico, he was present, November 27, at the bombardment of the Castle of San Juan de Ulloa, Vera Cruz, by the French squadron under Admiral Baudin. From his minute observations of the conduct, and results of this attack, he drew many inferences which were to prove very useful when, subsequently, he was to direct operations against shore batteries. His observations and opinions of the battle make interesting reading even today. "I had not at the time looked forward to a war with Mexico, but *I had made it a rule of my life* to note these things with a view to the possible future." This sentence was written after the war between Mexico and the United States.

During his frequent cruises abroad he met many distinguished persons, from Emperors and Kings down through the entire social scale, impressing all with whom he came in contact by his courteous manner, his modesty, and the unusual extent of his general information. These social incidents in his career can only be referred to briefly in this short sketch of his naval activities. When war broke out with Mexico in 1845, "I made

immediate application for duty at the seat of war, believing that my experience would be of special value to the Government."

Although appointed to the sloop-of-war *Saratoga,* in which he sailed to the Gulf of Mexico, he had the misfortune to incur the displeasure of his commander-in-chief, who not only failed to make use of his exceptional knowledge, but saw to it that Farragut had no part in the naval campaign.

While Farragut had as sweet a disposition as is compatible with self respect, he was not a man to be readily imposed upon, or slow to resent injustice or oppression. His appeal to the Secretary of the Navy for orders home with his ship on detachment from his command deserves quotation as offering a corrective to any misconception of his character as that of a weak man.

"I am fully aware, Sir, that great latitude must be given to the commander of a squadron, in order to secure his best exertions, but, if he uses his trust with prejudice or partiality, there is no alternative to the subordinate, but the one I seek; viz., to get from under his command and in so doing I am anxious that those who have shared with me the evils of my command should participate in the pleasure of my relief."

So home he came losing little or nothing, for the Mexican War was, by this time, practically over.

After this disappointing episode, we find him engaged in ordnance work, such as testing guns and preparing the naval drill book, until 1854, when he was sent to California to establish a Navy Yard at Mare Island, near San Francisco. A four years' tour of duty was followed by orders to command the *Brooklyn,* a new steam sloop-of-war, in which he made another cruise in the Gulf of Mexico, a large part of which was spent in aiding the American Minister to Mexico in his negotiations with the warring factions in that perturbed country. He had abundant force at his disposal in his new and powerful vessel but his chief strength lay in his personal charm, and his social gifts, made particularly available as they were in a foreign land, by his ready command of French, Spanish and Italian. For this cooperation with a diplomatic colleague, no naval officer of his time could possibly be superior to Farragut.

While education continues so long as a man lives, takes in-

terest in what goes on about him and keeps his mind fixed on his trade or profession, there comes a time when schooling, as such, ends to be replaced by the application of the things learned to the great problems of life. For Farragut this hour had now struck. Henceforward he was to demonstrate in his own person and by his own acts a mastery of the art of naval warfare, only surpassed, if surpassed at all, by Nelson and rivalled, we Americans claim, by no other sea fighter than Nelson.

Greater respect for his character and confidence in his ability could not be shown than in his assignment, January 20, 1862, to the command of the West Gulf Blockading Squadron with secret orders to "reduce the defenses which guard the approaches to New Orleans, when you will appear off that city and take possession of it under the guns of your squadron." New Orleans, the largest city in the Confederacy, is situated on the Mississippi River about 100 miles above its mouth. To seize and hold that stream was one of the cardinal operations imposed on the North by correct appreciation of the strategy of the campaign. An adequate force was therefore supplied Farragut. The defenses of New Orleans were placed some thirty miles above the head of the various mouths or passes as they are called. To the minds of a majority of men these forts offered an imposing, awe-inspiring obstacle, for Fort Jackson mounted seventy-five guns and St. Philip about forty. To bear the brunt of their reduction the Navy Department added to Farragut's vessels a squadron of some twenty odd mortar schooners, which he regarded with very little favor if not indeed as a positive nuisance. Above Fort St. Philip was a rebel fleet of fifteen vessels including the iron-clad ram *Manassas* and an immense floating battery covered with railway iron called the *Louisiana*. Below Fort Jackson were two chains stretched across the river:

"The task that lay before Farragut was, to break through the obstructions, pass between the forts, conquer the rebel fleet, and steam up to New Orleans, lay the city under his guns, and demand its surrender. For its accomplishment he had six sloops-of-war, sixteen gunboats, twenty-one schooners, each carrying a thirteen-inch mortar, and five other vessels. The fleet carried over two hundred guns, and this was by far the most powerful naval expedition that had ever sailed under the American Flag.

General Butler was at hand with a military force of fifteen thousand men, to hold whatever Farragut might capture, and if possible to co-operate with him.

The mortar schooners, with their convoys, went in by Pass á l'Outre; the others by Southwest Pass—all except the *Colorado,* which drew twenty-two feet of water and could not be taken in at all, as there was but fifteen feet on the bar. Great difficulty was experienced in getting over the *Brooklyn, Mississippi,* and *Pensacola.* The *Mississippi,* after being lightened in every possible manner, was dragged over through a foot of mud, by tug boats.

The mortar schooners were in their firing positions below the forts by April 18 when a heavy six days' bombardment began. The result of sending six thousand shells was practically negligible. Farragut's patience was sorely tried by this delay. He had never had much faith in the mortars, and now it was evident, as he had anticipated, that almost the only practical effect of the bombardment was to give the enemy long warning of the attack by the ships. During this period when Farragut was giving the mortar schooners an opportunity to prove their worthlessness, fire rafts carried down by the swift current were rendered innocuous by boats that, always in readiness, towed them clear of the ships against which the Confederates had dispatched them from above. Yet the time was not wholly lost since it could be devoted to the work of preparing for the battle about to ensue.

It is to be regretted that space forbids the insertion here of his order prescribing the measures to be taken by his captains to lessen the risks of the engagement and to bring to a maximum the efficiency of their vessels. This order appeals especially to the seamen, who can, better than the layman, appreciate its value as embodying the results of fifty years of exceptionally faithful study of the naval profession. Every contingency was foreseen, weighed and guarded against. A bold fighter, quick to act and as quick to think, Farragut never undertook any capital operation until all the conditions of wind, weather, light, tide, etc., were to his liking nor until his wonderfully keen yet broad mental vision had perceived and his trained technical judgment had assigned to every conceivable circumstance its due place and value in his plan.

No leader of men ever possessed in higher degree that happy combination of patient preliminary study with audacity of action.

A few of the many injunctions contained in the order for battle just mentioned may be quoted to advantage.

As Farragut proposed to run past the forts and push on against the swift current it was most prudent so to "trim" his ships, that is regulate the draft at bow and stern, as to prevent a vessel which might happen to run aground from being swept around and pointed down stream. Hence all were "trimmed by the head," that is to say to be deeper forward than aft. By this arrangement even if a ship grounded her nose would still point toward New Orleans.

Extra guns were to be mounted to fire ahead and astern, for his were essentially "broadside ships"; light howitzers to be placed in the tops and, as these were masted vessels, all spars to be landed which could be spared; stern anchors and towlines to be in readiness, etc., *Ex pede Herculem.*

During the progress of the bombardment Farragut called his captains together in a Council of War at which each gave his opinion. I have no authority except Navy gossip current a few years later for the story I repeat here. *Si non é vero è ben trovato.* According to this gossip his captains with practical, if not actual, unanimity held that the forts should be reduced before the fleet moved up to the city. After listening to these views with his invariable courtesy he asked:

Gentlemen, did we come here to reduce the forts or to take New Orleans?

The reply was to the effect that while the city was, assuredly, the objective it was necessary first to silence the forts.

Well, gentlemen, if we are here to take the city, let us go there and take it.

A remark delightfully typical of the man.

There now remained only two obstacles, an exceptionally swift current which his slow vessels (his flagship, the *Hartford,* rated only at eight knots) could overcome with but a very small margin of speed, and the chains across the river, for the forts themselves were not, in his view, obstacles, however much they might retard. While waiting for a change of wind to the southward, which would produce a slacker tide, he placed two gunboats at the disposition of his Flag Captain, H. H. Bell, who promptly ruptured these chains and opened the way to New Orleans.

The attempt to pass was to be made in the night, April 23-24; and, as the moon would rise about half past three o'clock in the morning, the fleet were warned to expect the signal for sailing at about two o'clock.

At five minutes before two o'clock the signal to weigh anchor —two ordinary red lights at the peak of the flagship—was displayed; but it was half past three, the hour of moonrise, before all was ready. In the light of the blazing rafts and bonfires, moon or no moon made little difference now.

The first division under Bailey passed through the gap in the chains, pushed on past Fort St. Philip, which fiercely attacked it, to find itself almost immediately hotly engaged with eleven rebel gunboats.

Then followed Farragut who, on board his flagship the *Hartford,* led the second division, receiving heavy punishment from the larger Fort Jackson as he went by. In avoiding a fire-raft, "she grounded on a shoal near St. Philip. At the same time the ram *Manassas* pushed a raft upon her port quarter, and in an instant she was on fire. A part of the crew went to "fire quarters" and soon subdued the flames, while the working of her guns was steadily continued, and she was then backed off into deep water. This movement turned the ship's head downstream, and it was with some difficulty that she was turned around against the current; but this was finally accomplished, and she continued to steam up the river, firing into several of the enemy's vessels as she passed. Among these was a steamer full of men, apparently a boarding-party. She was making straight for the *Hartford* when Captain Broome's gun, manned by marines, planted a shell in her, which exploded, and she disappeared. Watson* remarks that the Admiral stood during this critical period coolly giving his orders and watching the ship slowly turn, referring occasionally to a little compass which was attached to his watch-chain, though most of the time during the engagement he was forward observing the conflict."

The *Sciota,* carrying Fleet Captain Bell, was the van ship of the third division which brought up the rear.

The casualties, thirty-seven killed and 147 wounded, while not light, were surprisingly less than had been expected and they

*His flag lieutenant John Crittenden Watson.

abundantly justified the risk taken. It is only a master of the art of war like Farragut who can intelligently assume so grave a responsibility. The episode illustrates the soundness of Napoleon's maxim:

De l'audace, encore de l'audace, et toujours de l'audace

and it proved how correct in their views were his former associates in the Navy who had resigned therefrom to serve under the Confederate flag, one of whom, the second in command of the Confederate iron-clad *Louisiana* in this battle, stated, "Most of us belonging to that little naval fleet knew that Admiral Farragut would dare to attempt what any man would." Praise from an enemy is double praise.

Thus was accomplished a feat in naval warfare which had no precedent, and which is still without a parallel except the one furnished by Farragut himself, two years later, at Mobile. Starting with seventeen wooden vessels, he had passed with all but three of them, against the swift current of a river but half a mile wide, between two powerful earth-works which had long been prepared for him, his course impeded by blazing rafts, and immediately thereafter had met the enemy's fleet of fifteen vessels, two of them iron-clad, and either captured or destroyed every one of them. And all this with a loss of but one ship from his own squadron. Probably few naval men would have believed that this work could have been done effectually, even with iron-clads.

Having successfully run by the river defenses of New Orleans, Farragut proceeded up stream, demanded and received the surrender of the city, which was shortly after occupied by the Federal troops.

This great victory was only possible to an exceptionally gifted leader, who united in his own person wise grasp of the military situation, knowlege of its possibilities, and a courage *à toute épreuve*. In face of difficulties which would have appalled an ordinary man, Farragut did not shrink from accepting the tremendous responsibility of ordering an advance. It is well in this connection to recall an expression used by that great British Admiral, Lord St. Vincent, who wrote to Nelson, "Responsibility is the test of courage." Was ever a cardinal principle of action more convincingly illustrated?

Farragut had now possession of the largest city in the Southern states, as well as of the lower stretches of the Mississippi, the physical features of whose banks at this point made their control by him quite easy. The river here ran through the delta of its own creation, whose low, flat, narrow borders were completely commanded from the water. The adjacent territory as far as the city, was so cut up by canals and bayous as to forbid military operations on the part of the enemy. Nevertheless Farragut's work of driving the Confederates away from the river and opening it to a junction between himself and Foote, who was coming down victoriously, had only begun.

This was a very different story from running past Jackson and St. Philip, since heavy batteries had been planted by the enemy at many favorable points. Moreover, back of them lay the Confederacy and, if required, its armed strength. Farragut under repeated orders from the Navy Department to "clear up" the Mississippi "at every hazard" proceeded up stream and with his squadron got past Vicksburg.

This he did with the greater part of his fleet, in spite of the heavy volume of fire delivered by the batteries on shore. Above the city he joined forces with Admiral C. H. Davis who had come down the Mississippi. He relates his personal experience as follows:

> I was in my favorite stand, the mizzen rigging, when all at once the captain of the gun on the poopdeck wished to fire at a battery which would require him to point his gun near me, and requested me to get down, which I did, to avoid the concussion. I was only a moment in doing so, when the whole mizzen rigging was cut away just above my head! Although the shot would not have struck me, I would have tumbled on the deck. But, thank God, I escaped with only a touch on the head, which did not break the skin, and has not given me a thought since. This same shot cut the halyards that hoisted my flag, which dropped to half-mast without being perceived by us. This circumstance caused the other vessels to think that I was killed.

In Farragut's opinion, the move was foolish since no permanent good was achieved. This opinion is officially recorded in his report to the Navy Department.

> The Department will perceive, from this (my) report, that the forts can be passed, and we have done it, and can do it again as often as may be required of us. It will not, however, be an easy matter for us to do more

than silence the batteries for a time, as long as the enemy has a large force behind the hills to prevent our landing and holding the place.

In a private letter he says:

The river can only be kept open by having troops.

Brave and capable as he was, he labored under no delusion as to the proper sphere of ships.

Several minor affairs took place subsequently on the river, of which running the batteries at Port Hudson was the most important. In this instance in going up stream he lashed a gunboat alongside each of his heavier ships (on the port or disengaged side), so that if the latter was disabled in her motive power, she still remained under control. In his order of battle on this occasion he used the words now accepted as a cardinal maxim.

The best protection against the enemy's fire is a well directed fire from our own guns.

It must not be supposed that Farragut's stay in the Mississippi was without trials, and vexations, for opposed to him was an alert enemy who used every possible means of annoyance by building and sending against him rams, fire ships and other vessels and by erecting formidable batteries almost over night. These counter moves kept him exceedingly busy, as may well be imagined, and necessitated his occasionally running these batteries as well as the longer established ones at Vicksburg and Port Hudson.

It may be proper to conclude this brief story of Farragut and the Mississippi by remarking that Vicksburg was subsequently invested and taken by General Grant, thus completing, in accordance with Farragut's views, the opening of the great river and the dividing of the Confederacy into two parts.

The battle of Mobile Bay was the most brilliant action in which Farragut took part and the crowning achievement of his naval career. It resembles to the superficial observer that at New Orleans, but a close examiner will note several fundamental differences. True, the principal aim was to run by the defending forts of which there were two—Gaines, a minor work on a narrow point projecting from the west toward the channel (which

runs north and south), but separated from the latter by a wide sand bank, and Morgan, about three miles away, stoutly manned and armed with no less than eighty-six guns, on Mobile Point, which actually reaches the channel. Behind Gaines and Morgan, Mobile Bay opens out wide and long. Unlike the situation at New Orleans, these works were aided by pile obstruction driven into the flats off Gaines, reinforced by torpedoes planted in the channel (mines we should call them today), and behind them a rebel fleet which included the powerful iron-clad *Tennessee*. Farragut's movements were therefore restricted to the narrow main channel, partially if not wholly closed by these torpedoes and lying under the very guns of Morgan. After successfully passing through or by this barrier, he still had to account for the rebel fleet awaiting him in the bay beyond.

His order prescribing the preparations to be made on board each of his attacking vessels is a model for all naval commanders. With the technical details we have no concern here. Its chief interest lies in the proof it contains of Farragut's meticulous care to protect as far as possible his men and the motive power of his vessels. As at Port Hudson, on the port side (that away from Morgan) of each heavy ship he lashed a gunboat. Since these larger craft, designed to fight in broadside, were deficient in fire ahead and astern, he caused extra guns to be mounted at the bow and stern. Naturally these were light pieces, still far better than nothing.

It was Farragut's practice to have as many as possible of the conditions in his favor so that the event would depend wholly on the fighting, adventitious circumstances being eliminated. The appearance in the rebel fleet of an iron-clad joined with the formidable character of Fort Morgan to make him wait for the arrival of certain monitors. This was a precaution on his part against any subsequent accusation of undue rashness rather than an admission of the value of these craft. Like most of the seamen of that period, he was not convinced that, taking all things together, wooden vessels had lost any of their usefulness or were not able to render good service, even if they had to meet armored vessels.

The other consideration which affected the execution of his plan was meteorological. He would not move until the wind was

from the westward to blow the smoke of his guns into the eyes of the enemy, and when the tide was running flood to carry a disabled vessel into rather than out of the bay.

On August 4, the long expected monitor *Tecumseh* anchored near him. The wind, weather and tide being all favorable the next morning at 6:47 A. M., Farragut gave the word to get under way and carry out the provisions of his battle order. The fleet was in two columns; the right composed of two heavy and two light monitors, the *Tecumseh* leading; the left composed of seven heavy ships each with a gunboat on its port side. Very reluctantly and because the *Brooklyn* was especially strong in her bow fire, and was equipped with torpedo removing apparatus, Farragut allowed her to lead the port column.

The situation was calculated to dismay a stouter heart than Farragut's. On his right would be the tremendous battery of Fort Morgan; on his left the mines close aboard; ahead of him the rebel vessels in column, their broadsides bearing upon his leading ship and its successors in turn as they approached bows on. Some very slight diversion was effected on Morgan by six light draught steamers anchored to the eastward that delivered a flank fire upon that fort.

The Admiral took his own station in the port main rigging whence he could command a good view of the battle. His solicitous flag captain, fearing that he might be knocked overboard by some shock, sent a sailor to pass a safety line about him, a circumstance which gave rise to the picture of Farragut lashed to the shrouds.

At about seven o'clock that hot August morning the action began. Soon, however, disaster threatened to overwhelm his whole fleet for the leading monitor, *Tecumseh,* although directed to go close to Fort Morgan, leaving on the port hand a red buoy which, presumably, marked the end of the line of torpedoes, in the eagerness of her captain to engage the *Tennessee* went to westward of "the fatal buoy." This threw the whole line into confusion and, moreover, forced the wooden ships also to the left and over the mine field. One torpedo, struck by the *Tecumseh,* exploded and sank her almost instantly. The *Brooklyn,* instead of pushing on, stopped and backed down on the *Hartford.*

It was the most critical moment in the Admiral's whole career. Then it was that his long study of his profession came to the rescue and showed that to stop was to invite defeat, that the road to victory lay ahead.

A Confederate officer who was stationed in the water battery at Fort Morgan says the maneuvering of the vessels at this critical juncture was a magnificent sight. At first they appeared to be in inextricable confusion, and at the mercy of their guns; but when the *Hartford* dashed forward, they realized that a grand tactical movement had been accomplished.

The *Hartford* was nearly a mile ahead before the line could be straightened; but the vessels were soon able to pour in a storm of shell, shrapnel, and grape, that completely silenced the batteries; not, however, before they had all suffered more or less.

After passing the forts the *Hartford,* soon joined by her consorts, sank one of the rebel gunboats while the others took to flight. The ram *Tennessee,* however, gave much trouble. On a flush deck was built a sloping casemate heavily armored, covering about half the length. Her battery consisted of rifled six-inch guns, one at each end and two on each broadside. Opposed to these comparatively long range weapons Farragut had scarcely anything but smooth bore ordnance. The *Tennessee* drew several feet less water than Farragut's larger vessels. Obviously her best tactics were to run into shoal water where her adversaries could not go, and out of reach of their shot, hammer away on them at leisure. The desire to "have at" the enemy overcame the counsels of sound fighting and she plunged into the midst of Farragut's fleet like a mad bull. Her two structural defects, exceedingly slow speed and exposed steering gear, so operated to her disadvantage as to subject her to repeated ramming and shell fire. This finally caused her surrender, the closing episode of the battle. It is a matter of profound regret that the whole story of this great action cannot be told here. It is certainly an epic of war.

Fort Gaines was taken on August 6, but Morgan held out stubbornly until August 23, although invested by the Army as well as by Farragut. Upon the surrender of the latter his war service came practically to an end. He had brought to a successful and brilliant conclusion all the operations with which he

had been charged and had written his name ineffaceably at the head of the list of heroes of that tremendous struggle as well as next to Nelson's on that of the great sea captains of all history.

Yet his work had so taxed his splendid physical powers that rest and recuperation were imperative. Late in the year 1864, he returned home to be received at New York, the port of his arrival, with the plaudits of his countrymen who presented him with a house and the freedom of the city. On April 4, 1865, he accompanied President Abraham Lincoln in the latter's triumphal entry into Richmond, the previous capital of the now non-existent Southern Confederacy to whose fall he had contributed so much. Later the grade of Admiral was established for his express benefit.

He made one more cruise in 1867-68, that time in command of the European Squadron, during which he visited all the important ports from Kronstadt to Constantinople. Everywhere he was received with the distinction due to his character and his fame. The incidents of this memorable progress may be read in *Our Admiral's Flag Abroad* by his secretary, Major Jas. E. Montgomery. It was during this period that the writer had the honor of serving under him on board his despatch vessel and tender, the U.S.S. *Frolic*.

Possibly the most interesting episode of this voyage was a visit to the home of his ancestors in the Island of Minorca.

He died August 14, 1890, in the Commandant's house at the Navy Yard, Portsmouth, N. H., but his remains were interred in Woodlawn Cemetery, near New York.

A few anecdotes may profitably be quoted as illustrating his attitude toward life and duty.

Once when it was remarked that a certain officer was too young for promotion, and it would turn his head, Farragut, remembering his own experience, answered, "Well, if he can't stand prosperity, that will be his own fault." On the other hand, when some of the officials of the Navy Department wanted to pass off a lot of favorites as efficient officers, "Gentlemen," said he, "you can no more make a sailor out of a land-lubber by dressing him up in sea-toggery and putting a commission into his pocket, than you could make a shoemaker of him by filling him with sherry cobblers."

The Admiral said he always fixed his eyes on his object, and then pursued it with impetuosity, giving little heed to dangers and obstacles, calculating thus: "I have to take this place. The chances are that I shall lose some of my vessels by torpedoes or the guns of the enemy, but with some of my fleet afloat I shall eventually be successful. I cannot lose all. I will attack, regardless of consequences, and never turn back." It was this, primarily, which insured his success at Mobile. Another element which there came into play was his profoundly religious nature. He used to say that, in the confusion which ensued upon the sinking of the *Tecumseh* and the stopping of the *Brooklyn,* he felt that all his plans had been thwarted, and he was at a loss whether to advance or to retreat. In this extremity, his natural impulse was to appeal to Heaven for guidance, and he offered up this prayer: "O God, who created man and gave him reason, direct me what to do. Shall I go on?" And it seemed as if in answer a voice commanded him to "Go on!"

In talking about soldiers, he said he laid it down as a maxim that, "if once you get in a soldier's rear, he is gone." This was the key to his plan at New Orleans, Port Hudson, and Mobile.

Prominent Democrats urged Farragut, in 1868, to allow his name to be placed before their convention as a nominee for the Presidency. They inclined to the belief that "a man of liberal, national, and patriotic views, who is not regarded as a partisan Democrat, whose public career has been at once loyal and heroic, whose name is the signal for unbounded respect and acclaim," would be borne to the White House with enthusiasm. But their appeal was in vain; he had no political aspirations.

Admiral Shubrick, who sailed with Farragut, used to tell a story illustrating his linguistic powers. An old woman came alongside of the ship in a bumboat; but no one could communicate with her, as she seemed to speak an unfamiliar tongue. Some one suggested, "Send for Farragut; he speaks the language of the devil." Accordingly Farragut came on deck, soon found out that she was an Arab, and conversed with her quitè freely, to the amazement of those about him.

His education under the old Swiss schoolmaster gave him an interest in all athletic sports. He won a set of diamond studs in a foot-race with a brother officer; and even after his fiftieth

year it was no unusual thing for him to call up some of the crew of his ship and have a bout at single-stick. When in command, and particularly during the war, he invariably wore or carried his sword on shore with him, a habit which he had acquired when serving on the South American coast. In returning to his ship at night he frequently had to pass through the worst part of the seaport towns, where naval officers were sometimes molested, and being a good swordsman he remarked that if he should be attacked he had more confidence in that (his sword) than any other weapon. For many years he kept up a custom of going through certain gymnastic exercises on his birthday, to test his powers, and it was not till his sixtieth year that he abandoned it.

He had few secrets, expressed his sentiments freely, and remarked that "he believed in doing things open and above board, as such a policy in the long run would always give one the advantage over an intriguing adversary."

How well preserved he was physically, I know from the story told me by an officer attached to the old *Hartford*. During the weary days of waiting off Mobile the officers used to exercise on deck and in the rigging just after sunset. One evening after watching their gambols he crossed the deck and asked, "Can any of you do this?" He then took the toe of his left boot in his right hand and without releasing the hold jumped his right foot through the loop thus formed. Pretty good for a man sixty-three years old.

His stock of general information was amazingly extensive. I myself have heard him confound a number of learned men by his knowledge of the habits of the *teredo navalis*.

He took a fatherly interest in the young men who served with him. Did space permit I could state several instances of his great kindness.

He was a staunch friend, generous in his sympathies, not only in word, but in deed as well, courteous to all. His fame will live forever in history while those who knew him well still mourn his loss, less as a hero than as a man they loved profoundly. Among this latter number the writer claims the inestimable privilege of being counted.

BOMBING TESTS ON THE "VIRGINIA" AND "NEW JERSEY"

By Lieutenant Commander H. B. Grow, U. S. Navy

The following brief discussion of the bombing tests conducted by the Army Air Service against the old battleships *Virginia* and *New Jersey* is offered with two views: namely, to tell the service in general who did not have an opportunity to witness the tests what actually happened, and to impress upon the service the urgent need of developing naval aviation with the fleet. To the writer's mind, the only lessons learned were, that if an attacking force does succeed in registering one or two direct hits on a capital ship with heavy bombs that ship is doomed or at least crippled, but that if our fleet includes in its organization an adequate and well-trained air force the chances of an enemy registering the necessary hits are small, if not remote.

Conditions were so perfect for bombing on the day of the tests that hitting should have been easy, but were so artificial in all respects that no conclusions could be drawn of a comparative nature. It may have been that bombers did not desire to hit the targets or to sink them at once, since it could have easily been done under existing conditions.

The tests may be considered and discussed under four distinct heads: first, accuracy of the bombing; second, the tactics employed; third, effectiveness of hits; fourth, defensive measures possible. A fifth subhead might be discussed: namely, propaganda value—and in proceeding with the discussion of the various phases of the tests, this last will be mentioned briefly. From a publicity point of view, or propaganda point of view, the tests had little, if any, value. The sentiment throughout the observing ships seemed to be that it was a pity to see the vessels go down helpless and unable to defend themselves, and I believe that the tests will have more of a beneficial than a detrimental effect on the public mind in so far as the Navy is concerned.

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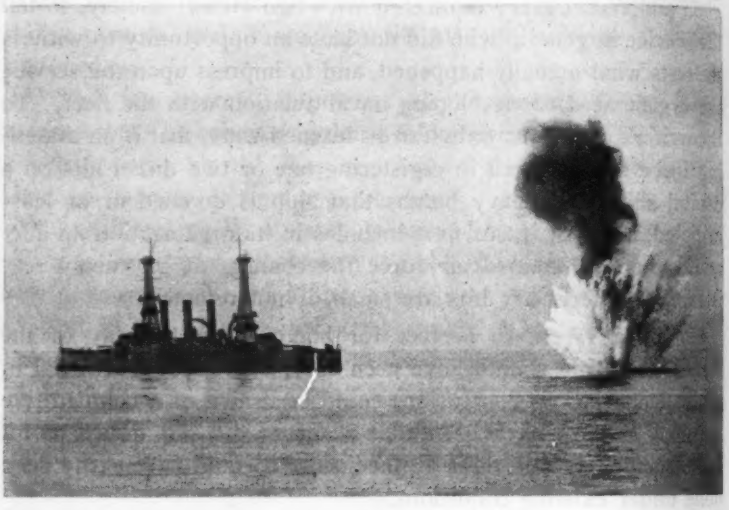
The plan of attack consisted of five attacks on the two ships. The first was to be conducted by six bombers flying at 10,000 feet and each carrying four 600-pound bombs and one 100-pound sighting bomb. The target was to be the *New Jersey*. The second attack was to be carried out by eight bombers, each carrying one 2,000-pound bomb and flying at 6,000 feet, followed by a third attack by eight more bombers flying at 3,000 feet with two 1,100-pound bombs each. Only two attacks were planned on the second ship, the *Virginia*. The plan was altered a bit, as will be noticed, but the results were the same.



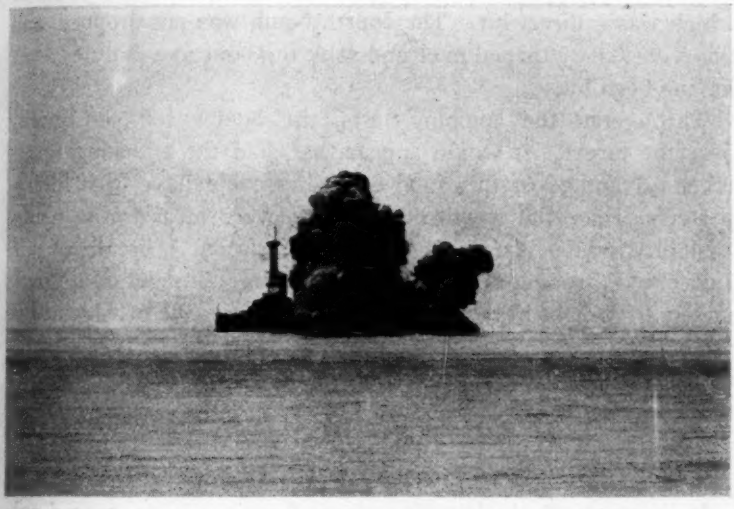
A Miss

Accuracy of Bombing

The first "attack" commenced about 8:40 A. M. It was actually conducted by five Martin bombers, each carrying four 600-pound bombs and one 100-pound sighting bomb. On the first passage over the target in column, each plane dropped its sighting bomb and they all fell approximately one-half ship length over. The column continued to circle at approximately 11,000 feet and as each plane passed over, one bomb was dropped. The bombing was consistent in that practically seventy per cent of all the bombs dropped landed in the same spot, about one-quarter to one-half

ship length ahead of the target *(New Jersey)*. The sixth or seventh bomb dropped was a direct hit, however, just abaft of the port forward eight-inch turret. A few moments later, a plane passing over dropped two bombs, both of which hit, one on either side of the mainmast. These were the only direct hits made in the high-altitude attack.

This attack was followed shortly, about 10 o'clock, by a flight of seven Martin bombers, each carrying one 2,000-pound bomb. The same procedure was followed, the flight circling at the pre-



THE HIT ON THE "VIRGINIA"

scribed altitude over the target and dropping singly. No hits were effected in this attack, although one 2,000-pound bomb fell close to the port side of the *New Jersey* amidships. As a result of the two attacks, the *New Jersey* took a slight list to port, which did not increase, however, nor did the ship settle in the water.

The third attack consisted of seven Martin bombers, each carrying two 1,100-pound bombs and flying at 3,000 feet altitude. The objective was the *Virginia*, as apparently it was thought the *New Jersey* was about to sink. The bombs continued to fall consistently over, with the exception of the fourth or fifth bomb, which was a direct hit in the vicinity of the mainmast of the *Virginia*. Subsequent bombs of the total fourteen dropped

failed to hit, although one or two fell close aboard. Thirty minutes after the first direct hit, the *Virginia* turned over and sank.

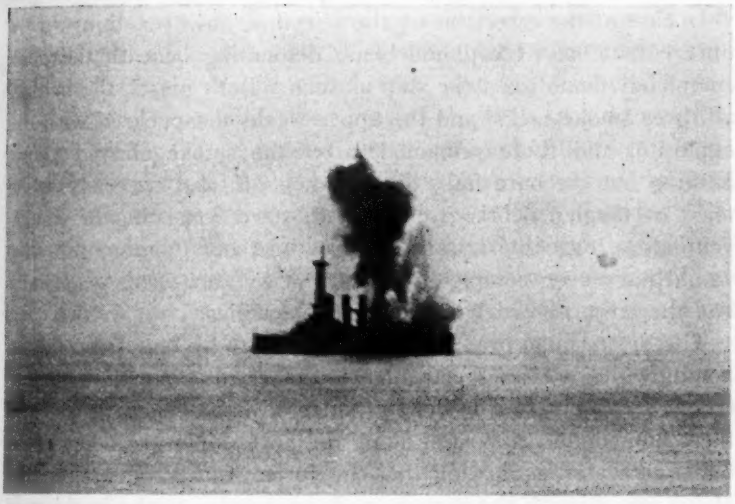
The fourth attack was made about 2:00 P. M. on the *New Jersey* by a flight of seven Martin bombers, carrying two 1,100-pound bombs each and flying at 3,000 feet. No hits were scored and the flight returned to their base with no serious effect on the *New Jersey,* although apparently one of the bombs had fallen sufficiently close to give the ship a slightly increased list to port. Two more bombers then appeared with two 1,100-pound bombs each, the first of which fell close to the ship, and the third of which was a direct hit. The fourth bomb was not dropped, and the *New Jersey* turned over and sank in about five minutes after having been hit.

Throughout the bombing tests, the bombs fell consistently over the target. It would appear that, had the attacking forces taken advantage of this fact, each ship could have been hit repeatedly, since the weather conditions were ideal for bombing. Visibility was perfect and there was scarcely a breath of air. I observed throughout the day only five direct hits out of approximately fifty-eight heavy bombs dropped, thirty-one of which were from 3,000 feet under ideal conditions. However, it is reasonable to assume that probably five or six more fell sufficiently close to the target to be effective.

Tactics Employed

In every attack the bombing planes flew in a loose, ragged column approximately one-half mile apart. This method of attack, of course, could not possibly be employed against any objective defended by fighting planes. Neither can an attacking force circle an objective for three-quarters of an hour or an hour choosing the wind and most favorable conditions before dropping bombs, even though local control of the air has been obtained. One of the most important recognized principles of bombing an enemy capable of defending itself is that the approach must be made, bombs dropped, and escape made, as rapidly as possible, and under no circumstances is it permitted or advisable to remain in the vicinity of a target longer than is necessary to drop. Had it been the desire to sink the *Virginia* and *New Jersey* quickly, it could have been done by any of the formations that appeared

subsequent to the 600-pound bombing attack. Had the bombers been flying in a close formation and had they dropped their bombs upon signal from the leader, in either case each ship would have received anywhere from three to six direct hits and would have been surrounded by as many more effective ones. Since the bombs dropped were in seventy per cent of the cases about one-quarter ship length ahead of the target, it can readily be seen that, had the planes been flying in close formation and had all dropped bombs at the same instant the leader did, the bombs of



TWO HITS FROM 600-POUNDERS DROPPED FROM 10,000 FEET

the succeeding planes could not possibly have missed the target. However, it is presumed that the bombing was conducted as it was to give each airplane crew a chance to demonstrate its ability to bomb rather than to sink the ships quickly. It is of interest to note here that under the conditions existing on the day of the bombing it was possible and quite easy to pick up with the naked eye approaching planes at a distance of approximately fifteen miles. These conditions, of course, will not always exist, but on a day such as the fifth of September the force being attacked could get into the air ample pursuit planes to destroy the attacking force before its arrival in the vicinity of the target.

Effectiveness of Hits

The three 600-pound bombs which hit the *New Jersey* caused very little real damage. It was possible from our position, with high-power glasses, to observe in detail the effect of these hits, and it appeared that nothing happened excepting a slight rupture of the side plating and superstructure, riddling of ventilators with fragments, and other superficial damage to the upper works. Naturally, any exposed personnel in the vicinity would have been killed, but the fighting efficiency of the ship as a whole would have remained undamaged.

In case of the direct hit on the *Virginia,* however, things were different. One 1,100-pound bomb detonating beneath the deck completely demolished the ship as such. Both masts, the bridge, all three smokestacks, and the upper works disappeared with the explosion and there remained, after the smoke cleared away, nothing but the bare hull, decks blown off, and covered with a mass of tangled debris from stem to stern consisting of stacks, ventilators, cage masts, and bridges. In my opinion, the ship would have been completely wiped out by such a hit, especially had there been powder in the after magazines.

The direct hit scored on the *New Jersey* by one 1,100-pound bomb, while not so spectacular in its result, was nevertheless quite as effective. The detonation took place below decks, and there immediately appeared along the port side a great geyser of bubbling water, indicating that the force of the concussion had blown out through the bottom, and the damage to the interior of the ship must have been terrific. In this case, also, a ship receiving such a hit and having its magazines full of powder would have been completely demolished.

There is no way of predicting what a direct hit with a 2,000-pound bomb would have done, but it is apparent from the effect of the 1,100-pound bomb that a 2,000-pound bomb would put any existing ship out of the battle. Other bombs falling close aboard apparently assisted in the sinking of these ships by their accumulated effect, but I do not believe that any one individual bomb falling close aboard would have sunk either of these two old ships, much less a modern ship in commission with its watertight integrity intact and its bilge pumps working. To my mind, a direct hit with a 2,000-pound bomb will have more damaging

effect on a first line battleship than will a hit close aboard, and there is no doubt whatever in my mind that any type of vessel less than a first line battleship would be completely demolished by one hit from a 2,000-pound bomb. It is impossible to picture the effect of such a hit on a transport full of troops, on a light cruiser or armored cruiser, or similar lightly constructed vessels.

Defensive Measures Possible

There are two methods of attacking an enemy fleet, or in fact, any objective. The attacking force can fly in formation at high altitudes and do salvo bombing or, under less favorable conditions, can swoop down and pass over their target singly, dropping as they go. To my mind, there are two distinct defenses necessary. The only defense against the high-altitude attack is fighting planes. I do not believe the present anti-aircraft guns, in no matter what numbers carried aboard vessels of the fleet, would seriously bother an attacking force at high altitudes. The only possible defense against such an attack is fighting aircraft capable of great speed and climb, since, when weather conditions are such that an attacking force can fly at great altitudes, they can also be detected at great distances and fighting planes can take the air and can get in position in time to attack them, and, moreover, if a defensive patrol is maintained by fighting aircraft, an attack can be intercepted.

For the other form of attack, I believe that each ship of the fleet should have a large number—say, ten or twenty—of supermachine guns firing a heavy one-inch projectile with a high muzzle velocity and flat trajectory. I do not believe that this projectile need be explosive, although the tracer element might be of great help provided the shape of the trajectory is not changed too much. It must be remembered that an airplane approaching to bomb will present, to all intents and purposes, a fixed target and, when bombing from a low altitude, must approach to almost directly over the target before the bombs can be released; and I believe that a ship or a group of ships with a large number of the type of machine gun herein mentioned could effectively repel a low-altitude bombing attack, since the rapidity and volume of fire would be so much greater than with the present awkward and clumsy type of anti-aircraft battery employed.

It must also be noted that the targets were anchored and that existing bomb sights do not compensate for course or speed of enemy, although experiments are in hand with such sights; but even though sights existed (and they probably will) which compensated for course and speed of enemy, a fleet maintaining a variable zigzag course would be very difficult to hit excepting

THE "VIRGINIA" AFTER *One* HIT WITH AN 1100-POUND BOMB

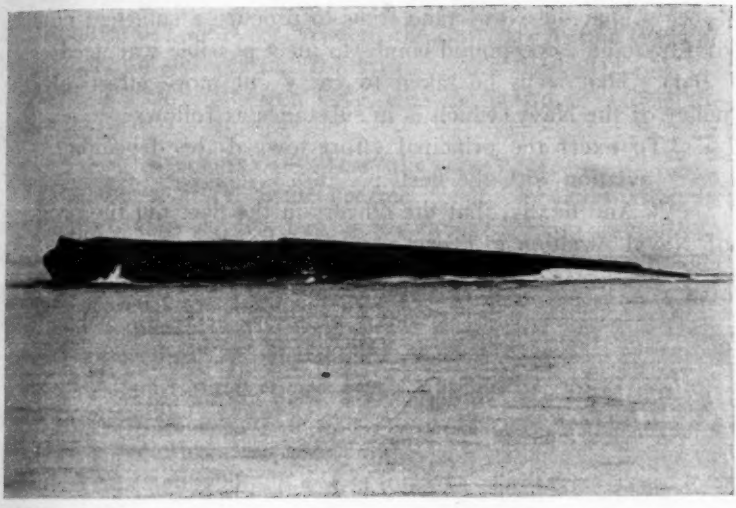
perhaps by salvo bombing. A bomb can be seen the instant it is dropped and can be followed all the way down. Also, it is possible by a little experience to predict, from the position of the plane, that it is about to drop its bombs and it is possible, I believe, so to vary the course of a ship or fleet by a systematic zigzag and by observation of the approaching planes that, even though our pursuit defense is inadequate or our machine gun

batteries fail, we may more or less effectively avoid being hit. This should not, however, obscure the fact that a direct hit with a 2,000-pound bomb would severely damage any first-class battleship and would probabaly put it out of commission.

Conclusions

From the above discussion, and from the observation of the tests, the following conclusions are drawn:

(a) That the battleship today, unprotected, is in grave danger;



The "Virginia" Going Down

(b) That in spite of this danger the battleship must remain as the first line of the Navy;

(c) That, should an enemy be able to gain control of the air at sea, victory for them is almost assured;

(d) That one or two hits from a 2,000-pound bomb would put any ship in existence out of the battle;

(e) That, to preserve the safety and integrity of our ships, Naval Aviation with the fleet must at once be expanded and developed to the maximum consistent with the terms of the treaty and the size of the fleet; and that, unless this is done, our fleet will

have to go to sea under such a serious handicap that defeat would be probable;

(f) That direct hits are probably more effective than those close aboard.

RECOMMENDATIONS

It is therefore recommended:

(a) That steps be taken at once to insure Naval Aviation sufficient funds and personnel to carry out the existing program of expansion;

(b) That the development of a one-inch, rapid-fire machine gun similar to that mentioned above be pushed to perfection;

(c) That the Navy take steps to procure a sufficient number of 1,000 and 2,000-pound bombs to meet possible war needs;

(d) That steps be taken to carry out more effectively the policy of the Navy, which is in substance as follows:

"To exert the principal effort toward the development of aviation with the fleet";

(e) And finally, that the officers in the fleet aid the progress of Naval Aviation in every way possible.

FOR THE WANT OF A WRINKLE A SHIP WAS LOST

By Captain H. E. Lackey, U. S. Navy

RECENTLY, while reading an official report dealing with the wreck of a naval vessel and the circumstances that led up to the disaster, I was struck by the fact that two good opportunities to take observation of the sun were lost by those on board, one, an observation for latitude and the other one for longitude, which might well have been the means of saving the vessel.

The following is an extract from the report referred to:

". . . the weather again became foggy, repeated attempts were made to take sights. During the voyage the sun and horizon were not visible together at any time, but at local apparent noon on . . . the sun could be seen but no horizon." . . . "Weather continued foggy and about 9:45 A. M. . . . the sun was again seen," but "no horizon" was again recorded.

The two opportunities for observations came at "local apparent noon" the first day and at "9:45 A. M." the second day despite the fact that as recorded there was "no horizon."

Some years ago while I was serving in the dual capacity of executive officer and navigator on board the U. S. S. *Wilmington* on the Asiatic Station the ship was going up the coast of China following what is known out there as the "inside route" and thick weather was experienced most of the way. During one stage of the passage while at anchor waiting for the fog to lift the sun broke through overhead but the horizon could not be seen. Though we felt sure of our position, the captain, then commander, now Rear Admiral W. L. Rodgers, U. S. N., asked me with a smile why I did not get an observation, indicating the clear disc of the sun showing through the haze above. Noting the question on my face he went on to explain that what he meant was by the use of an artificial horizon, not one of mercury but of molasses—Navy issue!

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The commissary steward was sent for and shortly we had a water bucket of molasses filled almost to the rim which a quartermaster proceeded to sling from the awning ridge rope on the quarter deck while all the deck officers and I were getting our sextants ready to give this method a practical test.

By swaying back and forth to counteract the slight motion of the ship we found but little difficulty in bringing the two suns together. The viscous property of the molasses prevented the shivering of the surface found when using mercury if any vibration is present. The lanyard on the bucket gave sufficient pendulum effect to keep the surface horizontal.

We all worked our sights and then waited for the fog to clear to check our results. These as I remember, when compared with our position as found later by cross bearings, came well within navigational limits.

Thus I believe that had this little "wrinkle" been known to those on the vessel in question she would not have been lost, inasmuch as the error that later was found to exist in their dead reckoning was more than ten times the error made by any of us that day on the *Wilmington* when we used the artificial horizon of molasses with the sun shining clearly overhead through the haze while the sea horizon was obscured by the fog.

SELECTION AND GRADED RETIREMENT

By Lieutenant Walter E. Doyle, U. S. Navy

THE selection-graded retirement system has now been operating in the Navy for more than seven years. The writer believes that this seven-year test has at least shown that the new system is a great improvement over the cumbersome old plan of promotion by seniority. Future legislation may, and it probably will, work great changes in the system as operated at present; but it seems, from all indications, that the principle involved in selection, accompanied by graded retirement, is with us to stay, and that any new methods the future may bring forth will simply be improvements in the practical application of that principle. It is readily apparent, in the general trend of service comment, that even the sharpest critics of the new system are quick to grant that the underlying principle is correct. Criticisms heard are directed at the manner in which the selection principle is applied. All this indicates that the new system is, if not entirely satisfactory, at least a long step in the right direction. The logical procedure for the future would therefore seem to be one involving an analysis of alleged faults, accompanied by suggestions for their remedy.

It is not intended, in this paper, to undertake so ambitious a program as the general analysis of alleged faults of the present system, with proposed corrections therefor. This paper is intended merely as a small contribution to a general analysis; and its scope is limited to the discussion of one feature of the present selection system which is now operated in what the writer believes is a faulty method.

It seems best in what follows, to present the discussion of this feature and its alleged faulty method of operation, by first stating just what the feature is, and what the writer conceives to be its faults of operation; then by following such statement with an examination of the general facts and the reasons for believing that the fault, as stated, is a real one; and finally by presenting

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a remedy which the writer suggests as a solution of the difficulty.

The feature of the selection-graded retirement system to be discussed is that part of the plan which will, within a few years, make the grade of lieutenant-commander the point from which the bulk of graded retirements will take place. It is not intended to criticize this part of the general plan; for plainly if selection and graded retirement are accepted at all, then it must inevitably work out that the grade just below command rank will, as soon as the system gets to operating normally, become the point from which the bulk of graded retirements will take place. The difficulty lies not with this feature of the general plan, but with the method by which it is operated. Stated briefly, the alleged fault of operation is the fact that within a few years many officers will be forced out in the grade of lieutenant-commander for the sole reason that they entered the Naval Academy at ages placing them among the older men in their classes. They will be forced out before they have had a chance to be either selected or passed over for the next higher grade. They will simply age out in grade before they have got high enough in the grade of lieutenant-commander to be within practicable reach of the Selection Board.

Before examining the facts and reasons for believing that the above fault of operation is a real one, a word of explanation is necessary as to just what is meant by the expression "within practicable reach of the Selection Board." Of course every officer who has served a certain length of time in the grade of lieutenant-commander, a definite part of which must be sea duty, is technically eligible for selection to the next higher grade. Assume, however, the case of a deserving lieutenant-commander who is technically eligible for selection, but who stands 150 from the top of his grade when he is within a few months of the age limit for the grade. If the next Selection Board has, say, fifteen vacancies to fill in the grade of commander, it is not likely to reach down over 135 heads to save this officer, for the very good reason that such action would involve passing over a large number of other deserving lieutenant-commanders. This assumed case illustrates the situation of an officer who is not within practicable reach of the Selection Board."

In examining the facts surrounding the above alleged fault of operation, the consideration presents itself first that, since selection began operating, no Naval Academy graduate has yet aged out in grade without first having been passed over. Each, so far, has had "his day in court" with the Selection Board. This has been true because the same legislation which, in August, 1916, approved selection and graded retirement for the Navy, also carried with it a large increase in commissioned personnel; and the graded retirement feature of the 1916 legislation was made inoperative for several years following the passage of the act which originated it. As is the case after all such increases, officers began fleeting up to the higher grades; and, by the time graded retirement began to operate, the fleeting up process had placed officers at the tops of the grades of lieutenant-commander, commander and captain who were considerably younger than the retiring ages for those grades, which are forty-five years, fifty years and fifty-six years, respectively. This condition still holds, and it will continue until the allowed number of line officers is reached; for, until allowed line strength is reached, the commissioning of each year's class of midshipmen increases the actual number of line officers and consequently increases in proportion the number allowed in each grade. For example, the commissioning of every 100 midshipmen results in an increase of one in the grade of rear admiral, four in the grade of captain, seven in the grade of commander, and fourteen in the grade of lieutenant-commander; and these increases cause the fleeting up of twenty-six lieutenants to lieutenant-commander, twelve lieutenant-commanders to commander, five commanders to captain, and one captain to rear admiral. If this fleeting up process could be continued indefinitely, no officers would be forced on the retired list by age in grade, without first having been passed over. It will not continue, however, beyond the graduation of the midshipman class of 1927—the junior class now at the Naval Academy—because the graduation of that class will bring the actual number of line officers up to and considerably beyond the allowed line strength. The allowed commissioned strength of the line is 5,499; the graduation of the class of 1923 brought the line up to an actual strength very close to 4,600; the midshipmen classes of 1924, 1925, 1926 and 1927 total up to about 2,400.

It is evident from these figures, even after the most liberal allowances are made for normal losses among officers and midshipmen between now and 1927, that the allowed line strength will be reached in that year. When this happens, promotions will slow up most noticeably, because the flow will then depend solely upon separations of officers from the service, such as by retirements, by graded retirements, by resignations, etc. Lieutenant-commanders will reach the top of their grade nearer, each year, to the retiring age for that grade. Eventually graded retirement will become a potent agent to produce vacancies and to insure a flow of promotion. But, under the present law, it will operate to the great advantage of a certain class of officers and to the immense disadvantage of certain others.

To understand this inequality of operation, it is necessary to make a study of the effect of graded retirement for the next ten years. Such a study calls for a certain amount of calculation, involving some approximation. A careful use of past as well as present Navy Registers will reduce the necessary approximation to narrow limits. Of course the precise effect of graded retirement, in the matter of producing a flow of promotion, cannot be determined for the future in exact figures. An estimate of its effect for the next ten years can, however, be made with sufficient accuracy to show where it is leading us. The writer has made such a calculation, and it was his first intention to set down in this paper each successive step and every figure from beginning to end, with accompanying explanations. It soon became apparent that such a procedure would have to be abandoned because of its undue length. The purpose will be served just as well by a mere tabulation of the main points resulting from the calculations. These main points are as follows:

(1) Graded retirement will not operate more effectively than it has in the past few years to produce a flow of promotion, until 1932 or 1933.

(2) When the line reaches authorized strength in 1927, the junior commander will not be more than twenty numbers below the top of the class of 1909.

(3) In making selections to fill vacancies in the grade of commander, between 1927 and the end of 1933, the Board will not find it necessary to go below the bottom of the class of 1910.

(4) The class of 1911 will not come within practicable reach of the Selection Board until 1934, the year in which those members of the class who entered the Academy at the average age of eighteen, will become forty-five years old.

It is evident from the above figures that the older officers in the class of 1911 will be the first of us to run into "the blind alley"—they will be forced out by age retirement without ever having had the chance of being either selected or passed over. The next year the process will be repeated for the class of 1912, unless the Selection Board spends two years on the younger men in 1911, in which case the situation for 1912 would be even worse. From this point on, events will take their natural course to produce a situation for each successive class wherein those members of the class who entered the Academy at an age beyond seventeen or eighteen will find themselves at a hopeless distance from the top of the grade of lieutenant-commander at the time they reach the age of forty-five years. An illustration will show what little chance there will be of the Selection Board being able to help these men. Suppose the Board is working in class A during the year that A's members of average age become forty-five years old. In that same year, men in class B, one below A, who entered the Academy at nineteen, will also become forty-five years old; and men in class C, two below A, who entered at twenty, will become forty-five years old too. The Board will, after the year 1927, have very few vacancies to fill each year in the grade of commander. In order to save a man in class C, it will be necessary for the Board to pass over large numbers of men in class A and class B. This, the Board naturally will not do, if the younger men in class A and class B are deserving of promotion.

Objection may be made to the above figures and estimates on the two principal grounds that: first, estimates extended over so long a future period are apt to be inaccurate; and, second, the size of the Navy may be increased within the next ten or twelve years, which would change everything.

The first objection may be met by granting it freely, with the reservation that the situation of the class of 1911, as shown by the above figures, is bound to come to some class, whether the above figures and estimates are strictly accurate or not. If it

be assumed that the estimates are wrong by the amount of an entire class, either way, it will merely mean that it will be the class of 1910 or 1912 which will be the first to run into "the blind alley," instead of 1911. The fact that the present day Selection Boards take several years to run through a single class, in selecting up lieutenant-commanders, is conclusive evidence that the above depicted situation will be upon us in the near future.

The second objection, that the Navy may be increased within the next ten or twelve years and thus change the entire situation, is of course a valid one. There are, however, several very strong reasons for believing that there will be no increase during that period of sufficient size to affect the commissioned personnel. Among them may be mentioned the fact that the Navy already computes its allowance of line officers on a basis of more than 135,000 enlisted men, while it is operating with an actual strength of 86,000 enlisted men. For an increase to affect the commissioned personnel, the Navy would have to be given an actual strength of more than 135,000 enlisted men, which, as a possibility of the next dozen years, seems most unlikely. Also, it may be mentioned that the Treaty for the Limitation of Armaments now officially and finally ratified, will by its own provisions remain in force at least until December 31, 1936.

It will be convenient at this point, in order to secure a concise method of reference, to designate an officer who entered the Naval Academy near the maximum age of twenty years as an "oldster"; one who entered near the minimum age of sixteen years as a "youngster"; and one who entered at the average age of eighteen years as "average."

It is apparent that the natural operation of the present law will soon place "youngster" in a position of great advantage, and "oldster" under a heavy handicap. Taking the extreme case of a "youngster" who is the youngest man in his class, it must naturally follow that every man senior to him in the Navy is older than he is. That being the case, he is certain of not being retired in grade without first standing number one in the grade; for, if he reaches retiring age in the grade of lieutenant-commander, it will not be until everybody senior to him has left the grade, either to the next higher grade or to the retired list. If

he is not passed over in the grade of lieutenant-commander, he will be in the same favorable situation in the next grade. He will, in short, be sure of "his day in court" with the Selection Board. His case presents a marked contrast with that of his classmate "oldster." Assuming the two officers to be of equal ability, "youngster" faces only the necessity of making good, while "oldster" faces the certainty that he will age out in grade whether he makes good or not.

The argument might be advanced that "youngster" is entitled to his tremendous advantage on the ground that "old age must give way to youth." That argument is scarcely pertinent when the maximum possible age difference is four years. Since it is law that young men are of suitable age to become midshipmen when anywhere between sixteen and twenty years, it must have been the belief of those who made that law that there is no great difference in the capacities of young men between those ages to receive instruction as officers. At any rate, they will go through the Academy on a competitive basis, with no handicaps offered or desired on account of age. It is hardly consistent to give them a start which allows a divergence in age of four years, and then to set up barriers, based on definite age lines, at various points further along in their careers. The only points in an officer's career where a straight age retiring line is necessary is at that point in his life where his capacity for work begins to fall off. Final retirement has very properly been based on age, and for the Navy has been set at sixty-four years; but it is to be noticed that none of the reasons for basing final retirement upon age can be used for basing graded retirement on age. Of course, justification of the present system is embodied in the argument that "a line must be drawn somewhere," and the age of forty-five is taken as a suitable point at which to draw it for a lieutenant-commander. Certainly it is necessary to draw a line somewhere, but it need not necessarily be an age line. If a definite age line is drawn, it must surely follow that "youngster" is gratuitously presented with enormous advantages over his "oldster" classmates.

It seems to the writer that a happy solution could be reached by following the precedent of the recent service pay bill, and basing graded retirement upon length of commissioned service, rather

than upon age. If the career of "average" is fitted to the present graded retiring ages, the following is the result:

Enters Academy at age of.....18 years.
Is originally commissioned at age of.....22 years.
At age 45, his total commissioned service is.....23 years.
At age 50, his total commissioned service is .....28 years.
At age 56, his total commissioned service is.....34 years.
At age 64, his total commissioned service is.....42 years.

With this as a guide, the law governing graded retirement could be changed so that its effect would be to place a lieutenant-commander on the retired list upon the day he completed twenty-three years commissioned service; a commander upon the day he completed twenty-eight years commissioned service; and a captain upon the day he completed thirty-four years commissioned service. The final retiring age of sixty-four years for all officers would remain unchanged. Such a change would not produce any incongruities of rank and age; it would merely level things off, and place the question of professional success strictly upon a basis of ability.

The age effect of this change would not be felt by "average," because his average conditions would be combined with the present graded retiring ages to be used as a basis.

The age effect upon "youngster" would be slight. If originally commissioned at twenty, he would be forty-three when he finished twenty-three years commissioned service; he would be forty-eight when he finished twenty-eight years commissioned service; and he would be fifty-four when he finished thirty-four years commissioned service. His final retirement for age at sixty-four would remain the same as it is now. Throughout his career he would be only two years removed from present graded retiring ages.

The age effect upon "oldster" would not place him any farther than "youngster" from present graded retiring ages; but it would be in the opposite direction. If originally commissioned at twenty-four, he would be forty-seven when he completed twenty-three years commissioned service; he would be fifty-two when he completed twenty-eight years commissioned service; and he would be fifty-eight when he completed thirty-four years commissioned service. Final retirement for age, at sixty-four, would for him also remain as it is now. Throughout his career he too

would be only two years removed from present graded retiring ages.

An illustration, serving also as a summary of the foregoing paragraphs, might make the operation of the proposed plan somewhat clearer. For this purpose, the cases of "youngster," "average" and "oldster," all taken from the same class, may be compared as to age and length of commissioned service at each of the division points in their careers.

At the time of their graduation from the Naval Academy, and their acceptance of original commissions:

"youngster" would be at the age of.....20 years;
"average" would be at the age of.....22 years;
and "oldster" would be at the age of.....24 years.

If all three failed to be selected for promotion to the grade of commander, they would be retired in the grade of lieutenant-commander, with data as follows:

"youngster" would be at the age of.....43 years,
and his commissioned service would be.....23 years;
"average" would be at the age of.....45 years,
and his commissioned service would be.....23 years;
while "oldster" would be at age of.....47 years,
and his commissioned service would be.....23 years.

If all three reached the grade of commander but failed to reach that of captain, they would be retired as commanders with data as follows:

"youngster" would be at the age of.....48 years,
and his commissioned service would be.....28 years;
"average" would be at the age of.....50 years,
and his commissioned service would be.....28 years;
while "oldster would be at age of.....52 years,
and his commissioned service would be.....28 years.

If all three reached the grade of captain, but failed to reach that of rear admiral, they would be retired as captains with data as follows:

"youngster" would be at the age of.....54 years,
and his commissioned service would be.....34 years;
"average" would be at the age of.....56 years,
and his commissioned service would be.....34 years;
while "oldster" would be at age of.....58 years,
and his commissioned service would be.....34 years.

If all three became rear admirals, they would finally be retired as they successively reached the age of sixty-four. This age would be reached first by "oldster"; then, at the end of two years, by "average"; and at the end of another two years, it would be reached by "youngster."

There seems to be nothing to object to as regards the respective ages up to which these three officers would be permitted to remain in the grades of lieutenant-commander, commander and captain, before being forced out by graded retirement. Objection might be made, however, to the conditions in flag rank; for if "oldster" were not selected to flag rank until he was close to the age of fifty-eight years, he would then have only a little more than six years to serve before reaching the final retiring age of sixty-four. Under present law, an officer who attains flag rank must do so before he is fifty-six, so that he serves in that rank a minimum of eight years. It must of course be left to wiser heads than the writer's to decide whether six years in flag rank would be sufficient to enable an officer to obtain the necessary experience as a flag officer to fit him for high command of a fleet, and also leave him the time to serve in that capacity. If, however, the proposed plan were set in operation, and if the minimum of six years in flag rank for "oldster" proved to be a feature of the plan meriting criticism, Selection Boards would simply reject "oldster" for promotion to flag rank, and no harm would result. The whole point is that "oldster" would have "his day in court" even for flag rank; and his chances of success in the grades below flag rank would depend upon no other conditions but his ability and usefulness as an officer.

No discussion involving a proposed change in laws governing commissioned personnel of the Navy is complete until the proposition has been carefully examined to make certain that it would not adversely affect the interests of the large number of officers recently commissioned from warrant grades, enlisted personnel and the naval reserve. A mere glance at the proposal to base graded retirement upon commissioned service, instead of age, will show that such a change would be the greatest kind of a boon to these officers. They, more than any of us, find little incentive to professional pride and enthusiasm in plodding along with the certain knowledge that they will be cut down by graded

retirement, no matter how thoroughly they make good as officers. Of course the proposed change could not assure the officers of this group, that they would make any definite point in the higher grades. Neither would the change force them to remain on the active list until the final retiring age of sixty-four years, for the laws governing voluntary retirement would operate the same as they do now. The proposed plan would merely assure them of the right to move along on the promotion list until they reached the age of sixty-four, provided they were not passed over before that time. That assurance is the most that is, or can be, asked for any of us.

While we are hearing so much these days of "morale," as applied to almost everything under the sun, we might join the popular movement and apply it to "oldster" under the conditions of a few years hence. If he is operating under the present graded retirement laws, his "morale" will unquestionably be at a very low point. When he pulls down his Navy Register and juggles a few figures, he will have no need of the higher branches of mathematics to produce a result which will not be calculated to boost his "morale." How different would the outlook be if "oldster," and "average" too for that matter, could look forward with the certain knowledge that they would have just as many years as any one else in their class to work their way toward a point where they would be within practicable reach of the Selection Board for promotion to the next higher grade. They would not have to live along in the vague hope that "something might happen" to save them from the fatal error of having entered the Naval Academy two or three years too late. They would know to a certainty that their chances of making their regular promotions and of remaining active members of their chosen profession would depend solely upon their own efforts. Such knowledge could scarcely fail to react most favorably upon their personal enthusiasm and professional attainments.

TAKING THE NAVY TO THE PEOPLE

By Lieutenant (jg) Wallace S. Wharton, U. S. N. R. F.

PUBLICITY—how can it be used to benefit the Navy? This is a question which everyone, with the good of the service at heart, should give due consideration. Publicity when properly used, is a powerful agent in educating the public to the needs and purpose of any institution. Due to peculiarities of the service the Navy is in far better position to supply the newspapers and other periodicals of the nation with material than the majority of organizations now making use of that field.

In doing this the Navy can bring its message to the people and in the people the Navy finds its ultimate support, for the Navy is an organization created for the benefit of every American citizen. Due to the "muzzle" regulations of previous administrations men of the naval service have been practically forbidden to write for publication. This regulation no longer exists and the Navy should take advantage of the opportunity to tell its story, nay stories, to the nation.

During the war the full value of publicity was first brought to light. True, the use of publicity antedates the war by several centuries, but not until concerted action by a nation of 100,000,000 people was necessary for the successful conduct of a war was it so extensively used.

Through great campaigns of publicity in the newspapers and magazines of the country the United States Government was able to float bond issues that a decade prior to the war would have flooded the market. The need for funds to win the great conflict was brought to the attention of the citizenry and when the various issues were put on the block they were taken up almost at once. Not only did this aid the government by supplying funds but it also inculcated in the minds of the people a desire to save. This factor of thrift which was created more than justified the campaign and benefited the nation almost as greatly as making it actually possible to win the war.

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Not only were the bond issues made successful by the use of nation-wide publicity but on matters of policy the government, during the war, was able to weld public opinion of the nation into one mold. This gave the government support in affairs both domestic and foreign and enabled it to carry on its program with a solid front.

Of course when the actual conflict had ended and the need for concerted action was not so apparent the people of the country began to express themselves along party lines and lustily condemned or approved the actions of the government as they saw fit. Even so publicity played its part in this.

Had President Wilson taken the people of the nation and Congress into his confidence during the peace negotiations there is a possibility that he would have succeeded in causing America to have entered the League of Nations. That question, however, is an academic one and must forever remain merely a subject for conjecture.

Had he conducted a campaign of educational publicity, instead of demanding, it is possible he could have had a Democratic Congress to support his policies. It was by the use of publicity that his opponents won their victory, for how else could the nation have acted with such unanimity in the succeeding elections?

These examples briefly demonstrate the power of publicity. Though the American people may profess a distrust of their press they are nevertheless prone to believe what they read in the papers and to take editorial comment as the truth, especially on questions with which they do not come in actual contact.

Since the war the field of publicity has been cultivated most extensively. Every politician, every public utility corporation and in fact every organization that must have aid from the people has resorted to publicity to bring its side of the question before the people it wishes to influence. Banks, department stores, show-houses, railroads, traction companies, automobile manufacturers, churches, social welfare bodies all have publicity staffs. Some of these are good-sized organizations in which a score or so of people are employed.

One of the first things a newly created organization does now-a-days is to appoint a press or publicity committee. It is the

duty of that committee to take news of the club's happenings to the press, and what is more important to get it in the papers. Individuals with ambitions to be considered prominent often employ publicity writers to get their names into print at frequent intervals.

Of course it is true that this publicity is often highly colored, and always favorable to the institutions making use of it. There are times when the publicity agents will try to keep news derogatory to their institutions from the news columns. However, in all of this there is a certain amount of stuff that is valuable and informative to the public. This the newspapers use.

In passing it might be well to say that an experienced newspaper man is seldom fooled by any of this publicity. He can detect it as soon as it is laid on his desk. Often the publicity has no news element in it but gives, inadvertently, a tip to a real story. In this event staff members of the paper are put to work and the facts secured.

Bald Propaganda Dangerous

One of the most insidious things in publicity is the propaganda that various organizations try to put over. During the war propaganda was extensively used to create and maintain the morale of the nation so that military losses would not seem out of proportion to the ultimate fruits of victory. The day of propaganda, especially "bald" propaganda, is gone except when used in such affairs as conducting a public campign for charity or some such move. Even in such cases it is to be seriously questioned whether the newspaper readers are so blind as not to see the propaganda earmarks.

The public will not tolerate sheer propaganda. The worst that can be said about any story or article appearing in a newspaper is that "it's merely propaganda." When that is said the article is condemned and usually whatever work has been done in creating a favorable impression of the cause involved is undone.

"Veiled" propaganda, however, is useful. An organization that is successful in keeping its name before the public through the medium of the press can be said to be using "veiled" propaganda for the results in bringing the public to know the

institution. It is an excellent form of advertising and when the actions of the institution are worthy of note and commendation a favorable impression is soon created in the public mind.

How does all of this affect the Navy?

What has gone before merely shows the possibilities and to some extent the dangers of publicity. Good publicity is that which "gets by" the editors of a newspaper and it succeeds in this because it has legitimate news elements or elements of a good human interest story.

As said before the Navy is indeed fortunate in that the peculiarities of the service are conducive to good publicity. The romance of seagoing folk and seagoing ways of doing things is still sought by the landsmen in print. Of this witness the sale of novels of the sea, the interest of the public in ships, and to bring it home to the Navy, the crowds that come aboard a man-of-war on visiting days. The Navy can capitalize on these factors and bring its message to the American people and in doing so do much to overcome the unfortunate attitude prevalent in many communities that the Navy is an economic waste.

The Navy of these United States belongs to the American people. They are interested in it and what is more they are proud of its heroic deeds of the past. Seagoing folk are always more democratic than military men. This is due to the fact that all men going down to the sea are forced to be on their own resources to a large degree, be they admirals or apprentice seamen. This reacts on the public in a way that is most favorable to the Navy, for it is always to be remembered that these American people are democratic and also that the romance and mystery of the sea appeal to them.

News of the Navy and stories about it are always eagerly sought out and read by the American public. This is done because they want to know about the Navy and because they feel that the Navy is of vital importance to them. There is, even despite sporadic outbursts against the so-called economic waste of the Navy, an inherent faith in the Navy on the part of the people. They regard the Navy as a symbol of defense vital to the nation's existence and also symbolic of the sovereignty of the United States.

What is more to the point, it is the right of the American

people that they should know about their Navy. True this interest may appear to Navy people as foolish inquisitiveness, but it is far from that.

Unfortunately the Navy has too often been the point of attack and the center of machinations by politicians who desire only a sufficient number of votes to secure for themselves the offices and selfish aims they seek. Much harm has been done the Navy by these schemes and it was from this source that the fallacy of economic waste arose. The American people, unable to get real facts, have often been hoodwinked by such men into believing that the Navy is far from what it really is.

Then too, the Navy has had to bear the challenges of disgruntled people and misinformed writers without being able to answer them, that is until the "muzzle" regulation was revoked. Much harm has been done by such writers who have often created the impression that the Navy is a remnant of the dark ages and that underlings are regularly spread-eagled, cast frequently in double irons, and treated in all manner of barbaric ways for commission of insignificant violations of regulations. Much of this stuff is spread by men who have been in the Navy and could not measure up to its standards. After getting out they proceeded to air their views, and because of the "muzzle" regulation the Navy could not answer these libels or correct the erroneous impression created in the public mind.

An example of what this kind of writing does can be found in the hazing problems of the Naval Academy. According to some writers this hazing business is nothing short of a Spanish Inquisition. No one has called attention to the fact that if a midshipman had to stand one-half of the punishment accorded a college freshman he would have just grounds for complaint. Recently there appeared three articles in the *Saturday Evening Post* that explained the reasons for the hazing. These articles clearly and concisely told how hazing was by some deemed necessary for the establishment of discipline and the *esprit de corps* of the student officers.

People are willing to believe what they read and when they can only read the false they cannot be expected to have ideas that are based on the truth. Take for instance the old dame who scornfully derided the story told by a sailorman about flying fish.

"I can believe about mermaids," she said, "for I have read about them, but young man you can't expect me to believe your story about flying fish."

There is a vast field in the Navy from which stories, both news and feature, can be written. In every land comumnity of any size a newspaper will be found, and that sheet, no matter how insignificant, will have stories of that community that are interesting reading to anyone. A ship is such a community and on shipboard things happen that are also interesting to everyone.

Of course Navy publicity cannot be crowded, any more than can any other type. However, when men of the Navy come to realize the great possibilities in the service there will be no lack of material. Sea yarns, target practices, ship routine, origin of naval customs and courtesies and scores of other things can be woven and in fact have been, into intensely interesting stories that landsmen as well as seamen enjoy reading.

Recently a large Northwestern newspaper printed a series of stories on everyday events in the Navy. The series continued for some time, with one story each Sunday. These stories created no little interest.

During the war the Navy was in close contact with the public. Men from the interior states shipped in the "outfit" and did their bit. They returned to their homes after the war and became Navy enthusiasts. These men form a nucleus around which the Navy can work in its publicity campaign. In fact the Navy cannot afford to allow the people to lose the interest they acquired during the war. Through the use of publicity this contact can not only be maintained but broadened.

During the Washington Arms Conference the nation followed closely the actions of the representatives in their work. Each community talked Navy almost exclusively. The people were proud of the victory won by American diplomacy, but later allowed Congress to pass a bill that did not provide for the maintenance of the Navy at the full 5-5-3 strength allowed by the treaty. Why? Because they did not have data at hand to inform them as to the needs of the Navy to maintain that strength. Here publicity would have won the Navy its just position, despite the political machinations.

Now comes the question as to what form publicity for the Navy should take and how it can successfully be worked. As

said before the scope of material available is unlimited. The stories can be straight news, feature stories, partly fiction and partly fact, or they can be expositions of naval policy. Of course everyone connected with the Navy will realize the difference between that information that can be given to the public and that which by its military nature is confidential. Leaving out material that even borders on a confidential nature the field is still enormous.

In Navy publicity rank must to a certain extent go by the board. A story about Bill Spivins, captain of the forward turret, may be of greater value, both from news and human interest angles, than a dry discourse delivered by Admiral Hevywate at the Squedunk Rotary Club luncheon. One, the admiral's speech, will be of local interest while the other may have all of the elements that make a human interest story that will be read throughout the nation.

News Sense is Important

The greatest difficulty in developing Navy publicity will be in getting the officers and men of the Navy to acquire a sense for news. This is important but is not at all impossible.

Navy men by the nature of their occupation are not trained to be newspapermen. This is a profession in itself, but there is nothing more mysterious about it than the operation of a ship is to the landsman. A newspaper man would hardly attempt to run a ship unless he had some training. However, there are many newspapermen, good ones too, that have served in the Naval Reserve and while possibly they may not be up to all of the fine tricks of navigation, they could get the ship from one point to another without disaster. So can the Navy man master the rudiment of news writing and gain the news sense without in any way becoming less efficient in his own profession.

One of the best ways of getting this ability is to study a newspaper. See what is printed and how it is written. Then too by asking newspapermen questions this source can be greatly augmented. Aside from stories pertaining to policy, which every newspaper has, it is safe to say that the story printed was printed because it was worth it. The truth of this can be seen if one stops to think of the enormous number of stories written by news-

papermen that never get into print. It isn't that the unprinted stories are poor, but merely that the ones printed are so much better.

As in navigation, there are certain fundamental rules that prevail in news writing. First in importance is the great news sextette, "What, Who, Where, When, Why, and How." These elements are in every story, be it a straight news story or a feature yarn. Second is the axiom that often the everyday things, with a slightly unusual twist make the best stories. Third is the ability to correlate the lines of action preceding and following a happening.

In a straight news story the most important thing is the lead. In good newspaper practice the lead is found in the opening paragraph of a story and in that paragraph the entire story is told, minus of course the unimportant details. A news story is built exactly opposite to a fiction story. In fiction the writer works up to the climax, which is at the end of the story, while in news writing the climax is first and the writer then works down, taking the most important details first and running down to the least important.

This is done for many reasons. First the average reader wants to know what the story is all about and if it is worth reading before he attempts to follow a column of type. The lead tells the story briefly and the reader can then judge whether it warrants further perusal. Then too, stories often have to be cut so they can be put in a given amount of space. In cutting a news story it is always done from the bottom. In this way everything but the lead can be eliminated and yet the story told. The details given outside of the lead are merely to give the reader as much information as is needed to make all factors of the story clear.

Feature stories vary in construction from news stories but follow fairly closely the general construction outlined. Feature stories are more nearly fiction types.

However, the writing of stories isn't the important factor now under discussion. That factor is the ability to judge news and to know when a thing is or is not news. In this day and age of specialists the Navy man will fare better in his publicity work if he co-operates with newspaper men. A Navy story may come up, the Navy man in touch with the affair may realize that it is

news but may not have the ability to handle the story to its best advantage. By calling in a newspaperman, and they are always eager to get a real story, the same end may be accomplished as if the Navy man wrote the story and sent it in. In fact the end may be attained in a much better way than if the story had been handled by the Navy man.

An example of this can be given by the work of the Portland, Ore., Navy Recruiting Station in operating a Navy news bureau. The officer in charge secured the co-operation of a newspaperman who was a Naval Reservist and a service was started that furnished newspapers in all parts of Oregon with news items and short feature stories at least once a month. If a big story broke it was sent out as a special.

At first the service met with little success. One or two papers outside of Portland printed the stories sent out but that was all. As the service developed and the country papers began to realize they were getting news that would not otherwise reach them more of the material was used and within three or four months about sixty per cent of the papers in the state were using the stories sent out.

Success of this service was due largely to a scheme thought out by the recruiting officer, Lieutenant-Commander Raymond E. Kerr, whereby men enlisting in the Navy from northwestern towns would form what was known as a "booster fleet." Chambers of Commerce in the cities and towns from which these men came agreed to co-operate and supply the men with booklets and news from home. In this way the men were kept in contact with affairs in their home towns. The men in turn were to act as boosters for their community whenever the opportunity arose. As the majority of the men were sent to the Pacific Fleet and were stationed in the coast ports they had the opportunity of coming in contact with large numbers of tourists and through them spread the gospel of "the old home town."

This scheme was of course published in practically every paper in the state, and what is more, many of the papers made favorable editorial comment on the scheme. When the papers began to realize that the Navy news service was not merely a thing to spread propaganda for a big Navy they began using all of the material sent out.

Stories for this service were chosen with two things in view, first the local interest, which was given the most consideration, and the sending out of stories that were not carried by the press association wires.

One month's batch of stories consisted of a story about sonic sounding and what it meant, an advance story about the cruise of the U. S. S. *Milwaukee* to Australia, a story telling that a certain number of students at the state colleges could take a cruise on some of the battleships and one telling of the opportunities for enlisted men to enter the Naval Academy.

In all of the stories care was taken to avoid "bald" propaganda, except when a recruiting party was sent out on the road. Then a story was sent out giving the itinerary of the party and telling of a motion picture reel that would be shown at the various towns visited. Even this was written in straight news style without trying to make an appeal for men to join the Navy, yet that message was carried in each story.

This station soon established itself as one of the leading recruiting stations of the nation. To say that it was entirely due to publicity would be stretching the point rather far but there is no doubt that publicity played a large part in this work.

Here is an example of publicity with service. The commanding officer of the station created a "booster fleet" and made the fact known throughout the state by the use of publicity. He went further and called attention of the bankers in the various towns to the fact that allotments could be made by the men to their bank and encouraged recruits to make such allotments. This too was brought out in the publicity, and in such a manner that readers were given the impression that Navy men were thrifty and that the Navy offered the young man the opportunity to save money. All of this was important for it created a favorable impression in the minds of the public.

This was evidenced when recruiting parties sent out from the station, after the campaign had been in progress for some time, were cordially welcomed by the civic organizations in the smaller towns. Instead of being tolerated, as formerly, these men were invited to address club meetings and given every opportunity to deliver their message and carry out their work in the community.

One of the greatest obstacles found was the educators of the

state. They assumed the attitude that by entering the Navy young men were throwing away all chances of receiving an education. The station worked up a story based on the creation of correspondence courses for Navy men and sent it through the news service. Fortunately the man in charge of the correspondence courses was an Oregon educator, L. R. Alderman, and the stories had considerable local interest. This story carried the message that Navy men could receive the benefits of an education and recruiting parties were then accorded more cordial treatment by the school authorities in the various towns.

Aid Newspapermen

Details of the system worked out by the Portland office have been given in some length to impress on Navy men the value of publicity and to prove that it can be made beneficial to the Navy. Its value in recruiting work was shown by the success of the scheme; and as in the recruiting work, publicity may be made to benefit the Navy at large if it is properly developed.

Men of the Navy can do a great work for the service if they will let down the bars and meet newspapermen on common ground. Too frequently a reporter goes aboard a naval vessel to get a story and is unable to see anyone except perhaps the boatswain's mate on watch. An officer alive to the situation can do much to create in that man's mind a favorable impression of the outfit. He can tell of some peculiar incident that occurred while at sea and thereby give the reporter the basis of a rattling good story.

Officers on shore duty, especially recruiting, will do well to cultivate acquaintances on the various papers of the city in which they are stationed. When the newspapermen realize that the Navy offices have news and will give it out willingly they soon acquire the habit of coming around for it instead of waiting to be called.

This situation is created by the Navy men acquiring the ability to judge news. Once that has happened the rest will be easy, for newspapermen are "for a man who knows news." Then too, the various offices can supply newspapers with accurate information on Navy matters. This is a point that must be developed. If the local newspapers can call at the recruiting station and get reliable

information on naval affairs much of the misunderstanding of naval matters will be eliminated.

The Navy might even adopt the Portland office plan to the extent of having each officer keep in touch with the papers of his home town. In this way the publicity scheme could be worked out to an advantage all the way round. This proved successful on last Navy Day, but why wait a whole year to carry on?

For a long time the Navy has had the reputation of being the "Silent Service." Perhaps it has been too silent for its own good. Now that the "muzzle" regulation has been abolished it would be well for the Navy to take advantage of the opportunity. A short extension course on news writing might even be worked out so that those wishing to do so could acquire the rudiments of news writing.

At present the Navy maintains a pictorial service under the New York Recruiting Office. This service is doing a valuable work in sending out Navy pictures, which are used in a large number of the big daily papers. This service is but a portion of the field that is open to the Navy along publicity lines. As a result of this service Navy pictures of interest to the whole nation are distributed so that the Navy and its work are being brought to the minds of thousands who see the pictures.

The main thing to work for is to get the Navy side of the story to the American people through the newspapers and magazines. This can be done by the Navy men becoming adept at judging news and then either doing the writing or telling some newspaperman about the elements of the story at hand. It is well to remember that often people close to a news story are unable to see it because to them it does not appear to be worthy of note. That is one of the obstacles, the worst in fact, to be overcome. It can be overcome, however, and when it has been, much will have been done towards "Taking the Navy to the People."

THE TREND IN SMALL-ARMS

By Lieutenant Commander E. E. Wilson, U. S. Navy

THERE are fads and fancies in small-arms just as there are fads and fashions in clothes. These fashions are cyclic in nature; things popular some thirty years ago are coming into style again. In small-arms the cycle has had three phases which may be called the "Schuetzen Period," the "Military Period" and the "Modern Period." Inasmuch as the science of small-arms firing is a portion of the naval profession it may be instructive to review the history and look into the influences which bring about the cyclic changes.

The so-called "Schuetzen Period" belongs to the years between 1880 and 1910. It was characterized by short range firing, usually from an enclosure, with any type of rifle desired and mostly in the standing or "off-hand" position. The shooters of the time prided themselves on their ability to "stand up on their hind legs and shoot." This style required the utmost nerve, for it is in the standing position that "buck fever" plays havoc.

Freedom in the choice of arms made this period the heyday of amateur and professional gunsmiths. It also encouraged experimentation with loads and equipment. The rifle ordinarily took the form of a long octagon barrel with fancy, hand-carved walnut stock, special butt-plates, palm rests, double set—or "hair" —triggers, fancy trigger guards and special sights. Much of the ammunition was hand loaded by the shooter right on the firing point. At two hundred yards, the popular distance, ten-shot groups one inch and a half in diameter were made. These compare favorably with the best results today.

The character of the target was one of the important factors in this style of shooting. The "ring-target" was used and it put a premium on accuracy. Thus whereas a hit anywhere in the aiming bull's-eye of the military target counts full weight, in the ring-target there are concentric interior circles, the center one counting the highest. It is not enough, then, to hit the bull's-eye;

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it must be hit in the center to count full weight. Thus the style of target helped to develop the high accuracy of the day.

The so-called "Schuetzen Fests" were popular, not only with the competitors but also with the spectators. The principal clubs were at Walnut Hill, in Massachusetts, Union Hill, near Hoboken and Shell Mound Park near San Francisco. At Glendale, Long Island, at a shoot held in 1895 over six hunred shooters of national prominence attended and 30,000 visitors were on the range in one day. American marksmen who competed successfully abroad were welcomed home by throngs of ardent friends. Shooting was a big part of the national life and it reached then a prominence and popularity it has not since attained. How much this popularity was dependent upon barrels of cold beer served on the firing line is a matter of conjecture.

The second great phase of small-arms development called the "Military Period" dates from about 1900 to the present. The enthusiasm of the Schuetzen Period extended into the Army and Navy and prompted the development of service arms and ammunition. Naturally this was a distinctly different problem. The fancy outfits of the Schuetzen Park had no place on the march or in the saddle. Since the Mauser style of rifle was the accepted type in most armies, the Military Period is characterized by the development of accuracy in the bolt-eye service weapon to the point where it compares favorably with the so-called "free-rifle."

The fundamental requirement of the Military Period was that the service rifle must be fired exactly "as issued." Since no modification of the arm was permitted, attention was forced on improvement in ammunition. The large ammunition companies and Frankford Arsenal accomplished this in friendly competition. With improvement in ammunition came the desire for increased range and so-called "service conditions." The first step was an advance to mid-range, 500 and 600 yards, followed closely by firing at long range, 800 to 1,000 yards. Difficulty with ammunition at the long range created a demand for a higher powered rifle and caused the Krag Jorgensen to give way in 1908 to the rugged, accurate Springfield. Improvement in both the arm and ammunition has continued until today the Springfield, though not as effective a battle weapon as the British arm, is the most accurate service rifle by a wide margin.

In spite of some opposition the Military Period has clung tenaciously to the principle of machine-loaded ammunition. Just as the Schuetzen rifle had no place in the field, so did hand loading find itself out of place. Machine loading, crude at first, developed rapidly along with the advent of quantity production into industry until now, machine loaded ammunition is the choice of all save a few "gun-bugs" who prefer to load their own.

The increase in range brought still another feature of the Military Period, the change in firing positions. When the standing position proved too unsteady for mid-range work, the kneeling and sitting positions became popular. Since these were unsatisfactory for long range, the prone position became standard. Ultimately the prone position worked back to mid and even short range until today we have few American riflemen of the modern school who can "stand up on their hind legs and shoot."

Another feature of long range work is the development of "wind-dope." The old Schuetzen expert had little to fear from the weather but the long range fellow found in wind, mirage and light changes, much to keep him busy. A change in wind direction and force would often mean as much as twenty feet difference in the point of impact at the target. Failure to anticipate the change resulted in disaster and the sport of outguessing the weather became one of the most fascinating features of long range work. At first flags were used as indicators of the force and direction of the wind. Later the drift of mirage or heat waves on the earth's surface supplanted the artificial aids. The successful military rifleman had to be clever at sizing up the topographical features of a range. The classic story is that of a midshipman who won an individual championship by judging the wind from the flapping of an arm of an old shirt draped by accident (or canny design) on a bush near an opening in the woods.

The Military Period has not been entirely successful in bringing rifle shooting to the most people. Long range firing restricts competition to certain limited localities. It is impossible to fire high-powered cartridges at long range in the vicinity of cities. Again, the civilian naturally resents domination by the military in his sports and pleasures. To be popular a sport must appeal to large numbers who can carry it on in their own way. Again, when firing is restricted to the military arm, all the fascination of

amateur gun-smithing, experiment and research is eliminated. The Military Period has succeeded in developing a superior military rifle, but the shooting game as a whole has suffered.

The third period, which has been designed as the "Modern Period," has really just begun to take form. It owes its beginning to two developments, first a renewal of competition with foreign riflemen, and second, the rise of the small-bore or "twenty-two." In 1921 a team of American riflemen went abroad to compete at Lyons, France, in the classic "Free-Rifle" Match of the International Shooting Union. To the surprise of all hands, including the Swiss, who had won the match fifteen consecutive years, America won the tournament and an American, Walter Stokes, of Washington, D. C., won the world's individual championship with the high aggregate for the match as well as the individual championship in each of the three positions, standing, kneeling and prone. This clean sweep was practically a victory of the American service rifle over the fancy "free-rifles" of Europe.

The 1921 team brought home with it, however, an entirely new outlook on the shooting game. They had found it a wonderfully popular sport abroad, so much so in fact that they were moved to seek out the reasons. These were quite obvious. First the short 300-meter range, which was fully enclosed with barricades and walls to trap wild shots, could be placed right in the middle of a city. Second, the ring target placed a premium on accuracy so that there was as much fascination in close shooting alone as the American found in his wind doping. Third, the elimination of wind through enclosing the range removed all external influences and elements of chance so that the score attained was an exact measure of the holding skill of the individual. No alibis were offered or accepted. Fourth, the "free rifle" brought to the shooter the lure of gun-smithing and restored that great pleasure, the ownership of fine ordnance.

In 1922 the American team successfully defended the Argentine Cup at Milan, Italy. Stokes again won the individual championship and was again dubbed "Champion du Monde." This time the team was better equipped, having modified the service rifle by the addition of such desirable features as heavy barrels, set-triggers, palm-rests and butt-prongs. While these attachments may have helped somewhat, the match was won through

superior team work and a definite superiority in the prone position. Foreign teams, unfamiliar with the use of the sling, prone, were reluctant to adopt it even after the lesson of 1921. It is likely they will be less reluctant in the future. Of the nine members of the team seven were furnished by the Navy, including Commander C. T. Osburn, Major L. W. T. Waller, U. S. M. C., Team Captain, Lieutenant Commander E. E. Wilson, Lieutenant Commander A. D. Denney, Captain J. Jackson, U. S. M. C., Marine Gunner Calvin Lloyd and Sergeant Morris Fisher, U. S. M. C. The other two members were Major J. K. Bolles of the Field Artillery and Walter Stokes. The five shooting members were Osburn, Bolles, Lloyd, Fisher and Stokes. The team was chosen in open competition at the tryouts held in Quantico, Va.

The important result of the renewal of intercourse with foreign teams is the revival in America of the "free-rifle" matches. It is certain that this style will be shot side by side with the military style in the future. Already there is a revival of amateur and professional gun-smithing in this country and interest is greatly stimulated. When rifle ranges return to the cities, the popularity of shooting will be greatly increased. Military shooting will be left more and more to the military and the civilian will run his own matches.

Simultaneously with the recrudescence of the Schuetzen style has come a great surge of enthusiasm for the small-bore rifle. This name is ordinarily given to .22 caliber rifles. Small bore shooting removes the handicap under which military shooting has labored, namely, the inaccessibility of rifle ranges. This style is fired indoors at fifty and seventy-five feet; outdoors at from 100 to 200 yards. The long rifle cartridge is used in both styles and its accuracy is astonishing. The low cost of ammunition brings the game within reach of all. This has resulted in enthusiasm in the organization of thousands of civilian rifle clubs, in the training of boys and even girls in school or R. O. T. C. units and in a revival of interest in college competitions. The movement is a spontaneous one which is being directed by the National Rifle Association of America in Washington, whence correspondence matches are run.

Naturally, since military shooting was in the ascendency at the birth of the modern small-bore movement, the new small-bore

rifles are adaptations of the service arm. Springfield Arsenal has developed the "1922 Springfield" modeled along the lines of the service rifle but designed for the small-bore cartridge. The Winchester Model 52 is another example of the same type. No doubt, as the game develops, the free rifle style will take its place more prominently in the small-bore game and add to the interest. Whereas most free-rifles are single-shot guns, the two rifles mentioned above are capable of rapid- and magazine-fire. Obviously each has its own field of usefulness.

Along with the free-rifle movement, and perhaps a little in advance of it, has come the adaptation of the service action to sporting rifles. The Springfield, handsomely stocked to suit the requirements of the individual, has become popular as a sporter. While not permitted in strictly military matches, this rifle comes into its own as a target gun for free-rifle matches. This has a tendency to swell the ranks of target shooters with game shooters who must remain idle otherwise, during closed seasons.

We find, then, two great subdivisions in the shooting game, the Military and the Free-Rifle. Each of these is again divided into the small-bore and large-bore classes. Since these four subdivisions make shooting possible for all manner of enthusiasts, it is evident that a revival is about to take place in the shooting game and that, if properly directed, this may assume great proportions and become an important factor in national defense. Riflemen are at last coming to the realization that any shooter, free-rifle, small-bore, game or otherwise, is better material for the military rifle game than one who doesn't shoot at all. Obvious as this may seem, it has not always been believed.

The degree to which shooting may be carried is indicated by an experience in Switzerland after the match last year. At Lucerne, the rifle team label on the baggage was an open sesame at the hotel. It developed that the manager, a colonel in the reserve, was an enthusiast and invited us to shoot with him on Sunday. The hotel barber was also a shooter and discussed the big match intelligently while cutting hair. Even the girl clerk, who recognized a picture of Walter Stokes which had been printed in the Kodak shop where she worked, had been a competitor in the "Flaubert Dames," or women's small-bore match. On the way across Switzerland on Sunday it was noted that every village and

hamlet had a Schuetzenhaus running full blast with white targets bobbing merrily across a green valley, while far up in the Alps, men and boys were shooting at paper targets stuck on trees alongside the track. At Lausanne, Josiah Hartmann, who built some special Martini rifles for us, smiled when we remarked on the popularity of shooting in Switzerland and admitted that he had a range of his own in the back yard and that every morning he fired a string or two before breakfast from his bedroom window while his children scored the shots in the pit!

Thus do the disciples of Wilhelm Tell hand down his tradition. It may be idle, but it is nevertheless interesting, to speculate on what influence the knowledge that the Swiss are a nation of riflemen may have had on the German decision to invade Belgium rather than Switzerland. No one can say, yet most people will agree that a handful of skilled riflemen at the entrance to a mountain pass would be somewhat more formidable than thousands of golf professionals, for instance, mobilized at Garden City, Long Island, in the defense of New York. Small-arms firing as a sport is enough of an asset in national defense to warrant considerably more support than it now gets. The problem before those interested is to restore it to its former position as a sport. Even in the naval and military branch there is great room for improvement. Many naval officers who wear their pistols gracefully at general drills would likely endanger themselves more than an enemy if they undertook to fire.

From the Navy's standpoint, the chief lesson to be learned from a study of this kind is the realization of the value of the small-bore. The time available for range firing is extremely limited. By transferrng the firing to the fo'c's'le, however, the time can be greatly extended. By utilizing a military small-bore rifle, officers can so train their men that they will be ready to fire for record after a much reduced period of range practice. The small-bore cannot supplant the service rifle, because there is a vast difference between the two, but it can supplement it. By entering teams and individuals in the correspondence matches of the National Rifle Association, officers can stimulate interest in training. This is true both of the rifle and pistol for they are developing side by side. It is only lately that we have had the military small bore rifle and the .22 caliber automatic pistol. They are simply waiting now for the Navy to take them up.

The lure of small-arms firing, to those who know it, is much like that of golf. There are certain mechanics to its technique that everyone must master, but once these are in hand the game becomes primarily one of self control. No one can hold a rifle or pistol absolutely steady for long, yet it must be held so during the firing interval. On the firing line a man fights a battle with himself. On one hand is the impulse to yank the trigger as the sight swings past the bull's-eye; on the other the will to hold and hold and not let go until the sights are steady on. Each shot is a battle with one's impulses; each bull's-eye, a victory for one's self. Like golf, shooting has its "form." One must even keep his eye on the ball and follow through. For a naval officer, shooting is at once a sport and a part of his profession.

Small-arms firing is entering the Modern Period with an appeal to every type of shooter, particularly the man of arms. Of the new developments, the small bore offers the most to the Navy. The live-wire gunnery officer who first provides himself with a half dozen "1922 Springfields" and uses them systematically in drills and competitions, will surprise even himself at the improvement his men will show when they get on the large-bore range. Just as the "free-rifle" and small-bore are opening up new vistas to civilian marksmen, so is the small-bore military rifle pointing the way to pleasure and profit for those in the naval service.

BACK TO NORMALCY WITH AMALGAMATION

By Lieutenant Commander Oscar Smith, U. S. Navy

LET us approach this subject in a different manner from other writers who have aired their views in the Institute. Instead of trying to make readers with decided opinions believe this discussion upholds their side of the question, only to find the writer actually showing that bias in his arguments which he has repeatedly disclaimed in his introduction; instead of such pussyfooting, we shall state boldly, that we are firmly and absolutely against amalgamation. We trust that such a plain statement will crystallize sentiment, and that those in the service who have thought upon the subject, and those who have not previously given it thought, will now consider the seriousness of the question, will make decision, and rally to the standard, for a fight to the finish against projects of this nature.

The proposed amalgamation contemplates joining the duties of the line, supply corps, construction corps and civil engineers. The arguments for amalgamation between any of these corps are quite similar. The arguments against amalgamation of any two of these corps are similar. In order to simplify verbiage the words "staff corps" will be used in this article to indicate all corps excepting the line; and the proposition will be considered as an amalgamation between the line and any one of the staff corps. It is considered that the same general objections exist against amalgamation between any two of the staff corps.

The writer chose the line of the Navy for his life work. All his training and education have tended toward perfecting him for the higher positions in the line. The vast majority of other officers in the line at the present time have gone through the same years of training and education. Had we desired duty in a staff corps, we would have lived a different life and prepared a different foundation. Any argument which tends to prove that the Navy would be benefited by our assumption of staff corps duties is specious and misleading. Denial of this obvious fact can come

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only from failure to appreciate the highly specialized nature of staff officers' duties, and the vast field of special information which a staff officer of ability must have at his command,—such information and underlying education being entirely different from anything that we have obtained in our own work.

It seems proper for us to assume that the years of watch standing, the hours we have spent on the bridge, in stormy weather and fog, our experience gained during the intensive period of training of the war, and our years at sea in peace, have better fitted us for the positions of higher command in the line than anything else we might have done. If that is correct, it is palpably absurd to claim that by study and general knowledge gleaned through association with line officers in one or two cruises at sea, the average member of any of the staff corps is in a position to emerge as a fully qualified line officer, after a short intensive time of study and an examination. We do not claim to be fit for selection as members of any other corps, and considering the ramifications of our training it is inconceivable that members of these other corps are fit for commissions in the line.

It might be well at this time definitely to oppose the proposition that seems to have grown up in recent years, that the successful passing of a theoretical examination is sufficient to qualify any man as a commissioned officer of the line or of any other corps. The experience of most commanding officers during the late war seems to have been, that for line duties, line officers of experience were best, line officers of little experience second best; newly commissioned Naval Academy graduates being better, as a rule, than any except the very best of men obtained from the other branches of life. To disagree with this is to claim that our entire system of training and education is at fault. That it is not at fault, is shown by the preponderance of opinion expressed, privately and officially, by the majority of commanding officers during the war. Doubtless the higher officers of the other corps found similar conditions true, through experience with their subordinates.

We grant the feasibility of a general ground work education at the Naval Academy for the combatant corps. This is done at present for all excepting the supply corps. But once an officer is grounded in his specialty, he should become an integral part of

that branch and should strive to perfect himself for the work of that corps. Close liaison and friendship between the corps is essential, but a general merger of the combatant corps would probably produce specialists of inferior ability for the work in each corps, without a compensating increase in efficiency of the Navy.

Would the proponents of this question of amalgamation have dared to mention the subject to Paul Jones, Farragut or Porter? We study their lives, tactics, plans and campaigns. Let us also study their common sense in dealing with personnel, and acknowledge frankly that these best men in the history of our Navy have wanted and asked for seamen and seagoing officers, when they wanted naval efficiency. Has the Navy so changed that sea experience and seamanship have lost their value? Is a few months' study of seamanship, and a successful examination, the equivalent of four years at the Naval Academy and years of watch standing? If not, then let us insist on sea experience and concentration on the duties of their corps for all officers, both young and old, and not be led astray by hopes of a millenium, where all officers know all things.

Proficiency in the line is obtained through study and experience at sea. Proficiency in the supply corps, construction corps and civil engineer corps is obtained by actual work and study in the specialized duties of those corps; and the assumption that the average officer in the Navy would be a better officer, if he had a thorough knowledge of the duties in all of these corps cannot be upheld by any practical application in civil life nor in the Navy; excepting in a few individual cases which do not refer to the vast majority of our commissioned personnel.

We shall not bring forward the arguments of those who would amalgamate. They have been shown to best advantage by writers who favor the proposal. It seems proper, however, for the personnel of the Navy to treat this matter frankly, and ask, "What is the guiding motive that prompts a bill of this nature, which on the surface is so contrary to Navy tradition?"

During the last ten years (and before that time) there has been a steady drive to merge the staff corps into the line. This drive reached its culmination in the abolishment of the distinctive colors on uniforms for staff officers, and the granting to commissioned

officers of the staff corps the right to the traditional titles of rank previously held only by officers of the line. With the reasons for this campaign, and with its results, this paper has nothing to do, except to show that this spirit of encroachment has actually existed, and to a great extent has gained its point in the past. Whether this same spirit which is now engaged in the effort to amalgamate the line and staff corps will gain its end this year, or in the future, is dependent upon those officers who appreciate the value of their own corps, and its necessity for existence as now organized. If we who oppose this bill sit idly by, as we have done in the past, such amalgamation will certainly take place, for it will be pushed by some people who have an abiding interest in it. But if we oppose it with united front, and hold this proposition up to the light, where all may see it, it will receive the ridicule and eventual death which it deserves.

It is not our intention to insinuate or charge that the present amalgamation bill is backed only by members of the staff corps, or supported by all members of those corps. The frequent defenses of the construction corps appearing in the NAVAL INSTITUTE completely refute any such statement, and the opinions of our personal friends in the staff corps who are proud of the achievements of their corps show them to be against it. Much of the backing for this bill seems to come from officers of the line, who misled by the success of engineering amalgamation, are willing to extend the idea in order to rid the service of corps friction, without duly considering the seriousness of the step.

As a counter measure, it might be well to initiate a new movement, based on fundamental requirements of the Navy, and backed by the traditions of the service. This move will be to enhance the prestige of each of the several corps. Let us train civil engineers to be proud of the technical abilities required of the officers of their corps. Let the supply corps be jealous of the achievements of their corps during the late war; and the magnificent record the officers of the supply corps made during the period of demobilization, and the numerous economies they have effected in the financial operation of the Navy. Let the members of the construction corps glory in the fact that they are selected from the highest graduates in the Naval Academy, that the work they do, and have done, can best be done by constructors who

have received their training and education; let the engineers who have chosen that branch for their life work make it a name to boast of, and by their advance in naval engineering design and operation, gain world-wide fame; and let the line content itself with its own work, and with the history of what the line of the Navy has done when called upon in the past wars of our country.

To do this will put spirit into each of the corps. It will make the civil engineer proud to be a civil engineer, the supply officer take greatest pride in being known as a supply officer, the constructor as a member of the construction corps, and the line officer as a line officer. Let each do his best in his own specialty, and by working together with what the nation gives us, we can place and keep the Navy in the high rank it deserves. The existence of specialized corps is itself proof of their necessity in the past. Let us not destroy the structure of our organization, without deep thought as to the necessity of corps in the present and future.

Everything moves fast and changes quickly in these modern times. Men who speak of tradition, and do not rashly rush ahead with projects regardless of the consequences, are spoken of as reactionaries. At times to be reactionary, is to be sane. The progressives have had power for many years. The time has come to call a halt, and consolidate our position. Let us get "back to normalcy," and make the best of our present situation, before we embark on new adventures.

CO-ORDINATORS—WHO? WHAT? WHY?

By Commander Charles F. Russell, U. S. Navy

THE questions indicated in the title of this article were presented to me in a forcible manner during the latter part of February, 1923, when without previous warning I received radio orders to report as the relief of the Co-ordinator Ninth Area. I consider that I keep fairly well abreast of the times, especially in naval matters, but the above orders had me guessing. After six months of study I am, therefore, attempting to answer these questions for such naval officers as may be interested.

Soon after the establishment of the Bureau of the Budget by Congress, it became evident to the President and to his advisers that some means should be adopted to reduce loss in the disposal of surplus property held by the government. It was a known fact that various departments were buying new material when their needs could be supplied from surplus stocks held by other departments. To solve this problem, the office of Chief Co-ordinator for General Supply was created by Executive Order. At the same time it was decided to establish field agencies throughout the United States under the Chief Co-ordinator. So a Co-ordinator for General Supply was ordered by Executive Order for each of the nine Army Corps Areas into which the United States is divided. The Fifth, Sixth and Seventh Corps Areas were combined under one co-ordinator, making seven co-ordinators in all who were given titles in accordance with the number of the Army Corps Areas to which they were assigned.

Originally these offices were mainly concerned with the locating and disposing of surplus government property. Very soon it became evident that there was a lack of co-operation along other than material lines among government departments. The duties of the co-ordinating agencies were therefore gradually changed and increased. Boards, or more properly speaking, committees were formed in Washington and placed under the supervision of the Chief Co-ordinator to study conditions existing in

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federal traffic, both freight and personnel; in federal real estate, both government owned and government rented; in purchasing supplies; in liquidation of government surplus supplies and property; in standardizing forms of specifications and contracts; in co-ordinating the hospitalization activities of the government, and to study the problems of printing, binding, and distribution of government publications.

Thus from being restricted to a specific purpose, the duties of the co-ordinators have gradually been increased and changed so that at present they are charged, as General Lord says, "With the duty of seeing to it that the most effective and economical use is made of the government's resources,—money, supplies, equipment, facilities, space, time and talent."

The co-ordinators are Presidential appointees, and are selected from officers of the Army and Navy. The Chief Co-ordinator is Colonel H. C. Smither, U. S. A., who has Captain H. P. Perrill, U. S. N., as his assistant. There are several army and naval officers on duty in the office of the Chief Co-ordinator. The co-ordinators of the First, Second, Third and Ninth Areas are naval officers, and all of the Fourth, Fifth, Sixth, Seventh, and Eighth Areas are army officers. The assistants in these field offices are army for navy, and navy for army officers.

The Ninth Area is composed of the States of California, Oregon, Washington, Nevada, Idaho, Utah, Montana and Wyoming. All government departments and bureaus in those eight states are in touch with the co-ordinator both directly and through Federal Business Associations. The co-ordinator is consulted in all manner of problems that are interdepartmental and many that are purely within the department concerned.

How many of the readers of this article know the number of departments we have in the United States Government? All know of the ten major departments, but how many of the forty-two independent establishments? In the eight western states of the Ninth Area there are a great number of bureaus and agencies all working under independent orders from their chiefs in Washington. In San Francisco alone there are over eighty such offices. If each one of these several hundred offices follows past practice and isolates itself from the others, the amount of duplication of effort is almost beyond imagination. The small leaks multiply into a flood of money from the United States Treasury.

It is the duty of co-ordinators to stop these leaks and to prevent this duplication. Their work is largely one of education. They are engaged, as President Harding put it, in "carrying the Gospel of team work, economy and efficiency" into the field of government service.

It must be borne in mind that the Chief Co-ordinator, his assistants and his field force are directly under the President of the United States. They are not attached to any bureau or any department but are functioning in a supervisory capacity on problems of all bureaus and departments. General H. M. Lord, an Administrative Aide to the President, is in charge of the co-ordinating agencies as a separate duty from that of Director of the Bureau of the Budget. This statement is made to correct a growing tendency to refer to the co-ordinating agencies as a part of the Bureau of the Budget. The Bureau of the Budget was created by an Act of Congress. The co-ordinating agency was created by an Executive Order.

To illustrate the actual way in which problems are handled by co-ordinators, a few instances will be given.

A shipment of two thousand tons of War Department freight at Camp Lewis, Wash., was moved to San Francisco by the U. S. S. *Pyro* at a saving of $10,000. This movement was arranged by my predecessor, Commander Ray Spear (SC), U. S. N. He also arranged for use by the Navy of the Army Transport docks at Fort Mason, San Francisco.

The War Department and the Navy Department now work out joint problems in each locality by means of local joint planning committees. Navy Department General Order No. 103 provides for these committees. The last paragraph of this order is the same as the last paragraph of War Department General Order No. 19, Section III, and reads as follows:

> For problems and situations in which agencies of other government departments have a local interest in common with that of the Army or Navy, the responsible official of the Army or of the Navy on the spot will co-operate fully and loyally with the local representatives of the other government departments concerned.

The Indian School at Fort Bidwell, California, needed a six-ton truck for three months to haul freight the twenty-five miles from the railroad to the school. The co-ordinator arranged for

the loan of a truck to this activity by the Navy Yard, Mare Island.

There is in operation an Interdepartmental Alaskan Traffic Committee at Seattle, whose duties are to co-ordinate government freight and passenger traffic to and from Alaska. This committee is under the supervision of the Co-ordinator, Ninth Area.

The problems in connection with the housing of government offices in federal buildings and in rented quarters are constantly before the co-ordinator. In San Francisco alone, considerably over $100,000 annually is paid by the government in rentals. This problem can be solved and this sum saved the United States by building a federal office building in this city. A similar condition exists in Seattle.

There is considerable duplication of official communication between parts of the country. Efforts are being made by the co-ordinators to utilize to the fullest extent Navy and War Department radio service by other U. S. Departments.

Wherever any department has material in excess of its needs, efforts are made to transfer this material to some other department. The idea is that the United States Government is the owner of certain material that is not being used. Why should not the government utilize this material rather than buy more of the same kind? The fact that the excess material is on charge in another department does not alter the fact that it has been bought and paid for by the United States. It is now possible to transfer property from one department to another by a transfer of funds.

The most effective way to prevent duplication and to bring departments out of their isolation is by establishing personal contact between the heads and chief executives of the various government bureaus and departments. This is being accomplished by the formation of Federal Business Associations in all cities of the United States where there are enough different government agencies to warrant it. Thus far about eighty such associations have been formed. In the Ninth Area seven have already been formed and steps are well under way which will lead to the forming of sixteen more. This will include every city where eight or more separate federal agencies are located.

The mission of Federal Business Associations is to bring into

closer relationship, personally and officially, the representatives of the various government departments and independent establishments located in and around the city concerned, to assist them to become generally familiar with the classes of federal business handled by the departments of their members and to co-operate in every possible way with their respective departments in the matter of efficiency with economy in conducting the business of the United States Government.

To be a successful co-ordinator one should be a tactful diplomat, a convincing conversationalist, an accomplished orator, an expert in efficiency, a trained statistician, and an all-around good mixer. Falling short in one or more of these qualities, one has to do the best he can with what he has.

THE AVERAGE NAVAL OFFICER —AN ESTIMATE

By Ensign Richard F. Armknecht, U. S. Navy

Note: This essay written by Ensign Armknecht when a midshipman was awarded the Henry van Dyke Prize for the year of 1923 at the United States Naval Academy. It is of interest not only for its subject matter, but also because it is an indication of the trend of midshipman thought.

"HISTORICALLY, good men with poor ships are better than poor men with good ships." [1]

Many years have passed since Mahan first voiced that opinion. It has stood the test of time because it is based upon the judgment of time. It is a basic principle underlying centuries of naval history, universally applicable, unfailing, immutable. It is as much a key to the future as it is a rule of the past. Historical principles do not change; the applications of them vary with the age, but the principles themselves are as constant as the sun.

We need not, however, accept this statement because our greatest naval historian asserted its truth. It is merely a logical conclusion drawn from history, and, as such, may be verified by even a brief reference to the historical sources. Many are the instances where rotten hulks have been kept afloat not so much by strength inherent in their decaying timbers as by the strength of the characters and the staunch bravery of the men who fought them. One of the earliest traditions of our own Navy is the story of how John Paul Jones compelled the surrender of a better ship when his own palsied *Bon Homme Richard* was in a sinking condition. As long as nations settle their difficulties upon the sea *Man* quality will dominate *Ship* quality in influence upon the outcome.

Man quality is in reality *Officer* quality. Great leaders have invariably given the credit for victory to their loyal subordinates, but it is well to remember that such loyalty is accorded only to

[1] Mahan, quoted from *Gunnery Instructions*, 1920. Chapter I.

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brave, capable and resourceful commanders. It is merely further evidence of their genius that they have succeeded in inspiring such devotion in men.

We have in our Navy men whose presence on a ship insures a high standard of efficiency aboard. Their personal qualities are such as to transform a poor ship into a good one. Such a leader is of unquestioned value; in fact, it is hard to over-estimate the worth of a single efficient officer. No student of naval history will doubt that Nelson's presence on the flagship was worth half-a-dozen ships of the line to the British at Trafalgar. No one will deny that upon his shoulders rested the chief responsibility, nor will any doubt that he merited the applause of the nation which he served. In every case where the contesting forces are at all equal the direct responsibility for victory or defeat devolves upon the men in command.

If officer quality is of such paramount importance we will do well to estimate the worth of our naval leaders. We have long been estimating our strength in ships. We have calculated minutely the value of each unit in time of war. Surely it is time to apply the same test to our officers. It is obviously unfair to judge only by the best—it is even less fair to judge by the worst—of our officers. This essay is intended to estimate the fitness of the *average* officer for the position he must fill in time of war, to determine his qualifications and his handicaps; in short, to judge his worthiness of the trust and confidence with which the nation regards him.

This subject first attracted my attention as a purely personal problem. I had never seen an officer before I entered the Academy. I was naturally curious to learn the kind of man I was expected to become. I had also to discover whether I really desired to become that sort of man. Daily contact with officers both ashore and afloat has given me certain definite impressions which I shall here set down. I have no personal bias because I am not yet one of them. Most of the material for this essay was collected when I was doubting either my ability or my inclination to become an officer. I offer it as a candid and earnest expression of the results of three years of study.

The part of the general public interested in naval affairs knows that there are approximately four thousand five hundred officers

in our Navy. It presupposes a certain degree of professional knowledge upon their parts. It expects them to know navigation and seamanship, ordnance and engineering. It realizes that they are being trained for war command, but of the nature of that training and its efficacy in fitting officers for the exacting duties of war it knows little or nothing. I shall not attempt to analyze the system of training, for the system itself is not so vital as are the results obtained, but I shall attempt to measure the result of an average amount of that training upon the average officer.

Our average naval officer has reached the grade of lieutenant. He has been in the Navy about twelve years: four at the Academy, eight at sea. He has had time in which to become thoroughly acquainted with his profession. He has become a part of the Navy. In the main he is a Navy product, educated by the Navy and for the Navy. The worth of his training will be reflected in the Navy as he makes it. There are certain elements in his education which must be examined if we are to arrive at a just estimate of the man.

The training of our average officer began at the Naval Academy. He entered after mental and physical examinations designed to weed out the less desirable. During his four years at the Academy a constant eliminative process returned to civilian life those who failed to conform to the standard. It is not pretended that this process removed all of the undesirables. Neither did it retain all of those who might have made capable officers. But it cannot be doubted that its general tendency was toward improving the quality of the graduates.

His training at the Academy was of necessity but a groundwork for the training to come after it. An attempt was made, then as now, to send out graduates who knew fundamentals well enough to use them as a guide in a further acquisition of knowledge. Of course that attempt was in some measure unrealized. Many graduates entered the service with only fragments of knowledge. What they knew was merely a composite jumble of facts, unappreciated because they were not co-ordinated and ready for use. Most of this knowledge was useful knowledge, only the average graduate had yet to learn the use of it. In this particular our average naval officer was no worse off than the graduates of other schools. His lot was even better than theirs because he had not been allowed to waste time on electives and

because the goal of those four years of effort was never lost sight of by those who supervised his training.

Since graduation our average officer has had eight years in which to find his place in the organization. He has ceased to wonder whether he might not have done better "on the outside." His viewpoint has become the service viewpoint. He is definitely a part of the Navy and is fairly representative of the whole. Our estimate of him as he is today is an estimate, a fundamental estimate, of the Navy itself.

In at least one particular the average naval officer is far above the average civilian. He is definitely capable physically. He is erect, taller than the average, and generally well-developed. It is right that he should be, for there is no profession in which physical stamina can be used to better advantage than in that of a seagoing officer. If he goes up for promotion he must pass a physical examination or be eliminated. His daily life is a continual test of his fitness in that it requires of him a constant example of erect bearing and personal neatness. While it is perfectly reasonable to suppose that a physically weak man might occasionally be a very good officer, it is gratifying to know that our average officer, no matter what his other shortcomings, at least looks the part.

In weighing the mental qualifications of our average officer we must consider the quality of his leadership, his professional knowledge, and his attitude toward his profession.

The average naval officer is not a natural leader. That is to be expected, for the best available authority states that but two per cent of men are natural leaders. It would be folly to suppose that our officer personnel comes wholly from that two per cent. But a study of our average officer reveals that the habit of command is a part of him. His experience at sea as a watch and division officer has made him accustomed to being obeyed. Although he is not a great natural leader he has grown into the ability to control men. He has learned leadership because his profession requires him to be a leader. With such training it is natural that he should be at his highest efficiency when the tasks required of him are of a routine nature. He has learned to administer by following routine; he is perfectly familiar with it, thoroughly acquainted with the traditional methods of doing things. By holding to tradition he is certain of doing his work acceptably,

even if not to the limit of his efficiency. From the standpoint of executive method the naval officer is one of the most conservative of mankind. It is true that executive methods in the Navy advance, but they advance through the efforts of the few officers who solve their problems in their individual ways instead of doing them by rote. Imitation is so easy that the average officer falls into conservative habits of thought. As one writer has said,[2] "he finds more pleasure in old methods of doing than in new modes of thinking." The Navy, as well as the world at large, progresses through the efforts of the very small minority that will not be denied. There is such a minority in the Navy—it is perhaps a more substantial minority than in the world at large—and it is the leaven of searching intelligence which accounts for all naval progress.

Our average naval officer has a real interest in the technical side of his profession. While the examinations for promotion do not weed out all who are wanting in professional knowledge, they at least compel the officer to make some effort to learn. The facilities for learning are of the best, for every officer is purposely shifted through a variety of duties, both deck and engineering, until he knows the essentials of several departments. He has not been permitted to specialize, as has his brother officer in the British Navy; but his natural inclinations have usually led to a specialization, conscious or unconscious, in the particular phase of naval activity in which he is most interested. Thus some officers have a paramount interest in navigation and become expert navigators. Others interest themselves in gunnery or engineering, radio or aeronautics, until they are thoroughly conversant with these subjects. An officer who knows a subject thoroughly will, by his conversation, improve the knowledge of his officer shipmates in that subject. In return he learns from them the things they know well. This fact, combined with the enforced application when he occupies positions other than the one in which he is most interested, tends to make his knowledge general. And it in no wise lessens his interest in his favorite subject, the special subject which is likely to lead to his greatest service to the Navy.

Because the average officer is of a mechanical turn of mind

[2] *Handling Personnel*—Soule. (Quoted from Colonel E. L. Munson, U. S. A.) page 113.

machinery in the Navy has made enormous strides compared to what Mahan calls "the art of naval warfare." In Mahan's day he was much disturbed by this attitude of naval officers. He said, in one of his addresses before the War College:

> What wonder then, gentlemen of the Navy, that we find our noble calling undervalued in this day? Have we not ourselves to blame for it in this exclusive devotion to mechanical matters? . . . . . The steed is all; the rider naught! . . . . . Have not we, by too exclusive attention to mechanical advance, and too scanty attention to the noble art of war, which is the chief business of those to whom the military movements of the Navy are entrusted, contributed to the reproach which has overtaken both us and it?[8]

The condition Mahan pictured does not apply in the present day. The Navy is in no sense a reproach, and the popularity of the course at the War College evinces a real interest in warfare as an art. But the average naval officer—and it is he with whom this paper deals—has, as yet, too little interest in this all-important phase of his profession. It is unfortunately not possible to fight a battle every day. General quarters is an attempt to simulate locally the condition of action. But it is a drill, requiring assiduous attention to minutiæ and constant supervision of each bluejacket's part. Thus the average officer finds himself so engrossed with details that he has little time in which to imagine the larger phases of bringing the ship into action. Without proper strategic and tactical forethought the guns, no matter how efficient their crews might be, would go for naught. The importance of the study of warfare as an art is readily recognized. The more comprehensive maneuvers of recent years have stimulated interest in tactics, but there is still much for the average officer to learn concerning the conduct of naval operations.

There are also instances where the passion for creating new weapons has not been balanced by a thorough study of their use. Take, for instance, the development of the torpedo. The modern torpedo is a marvel of mechanical complexity and efficiency. Many officers have contributed to its increase in power and effectiveness. Improvement has been steady because officer interest in it as an intriguing mechanical puzzle has never slumped. But statistics show that, in spite of the fact that the torpedo has many more ways in which to go wrong than has the man who directs it, fifty-one per cent of the misses in the last torpedo prac-

[8] NAVAL INSTITUTE PROCEEDINGS, vol. 14, page 627.

tice were caused by errors in operating the director. When it is realized that the director is operated by a commissioned officer, that it is in no sense a complicated instrument, and that mistakes in operation are in a great measure chargeable to insufficient practice on the part of the officer concerned, it is time to consider if more time might not well be spent by the average officer in drilling himself and less upon the development of mechanical aids.

Conversation with officers lately returned from the destroyer service, where officers of about average rank are in command of the units, discloses another phase of the same condition. Administrative ability of a high degree is necessary to operate a destroyer effectively. There is less discipline, less system, to help the destroyer commander than is at the disposal of the captain of a battleship. If his task is to be well performed such an officer must maintain his crew at a high state of morale, which is to say, he must be able to depend upon them for many things which he and his officers cannot personally supervise. It takes more than departmental rules, more than routine decisions, to bring a crew to such efficiency. Constant thought, constant effort are needed —and it is here that the average officer finds himself most at a disadvantage. He somehow does not dare to rely upon his own powers of mind. He does not seek assiduously for solutions to the problems confronting him. He is content to do what he knows *must* be done, but unwilling to consider what *might* be done.

This criticism of the average officer should be balanced—if we are to do him justice—by considering the degree to which men in other walks of life are limited by this same mental lethargy. Thought—earnest, plodding, brain-racking thought—is still the rarest and most valuable commodity in life. There is in the Navy a leaven of painstaking intelligence. The percentage of officers who think conscientiously about their tasks probably compares very favorably with the number of men in the commercial world who run their businesses instead of allowing business to run them.

We may safely judge our average naval officer's attitude toward his profession by the interest he shows in it. For most officers the Navy holds a vital interest. Our average officer must eat, sleep, work and travel aboard his ship. In consequence he thinks

much about his ship and the Navy it represents. This interest in naval matters may limit his attainments along other lines, but it is most beneficial in developing his professional qualities. Golfers are not more enthusiastic about golf than naval officers are about ships. A new and powerful type of ship is to them a subject of absorbing interest. Our average officer is now being encouraged to express these enthusiasms to the outside world through the medium of short addresses and articles for the press. When he can do this effectively he will have added to his professional worth.

The war is recent enough to give valuable testimony as to the behavior of our average officer in time of stress. Nor should we neglect this important factor in estimating his worth to the nation. The war provided stimuli enough, necessity enough, and hardship enough thoroughly to test the mettle of our average officer. His response to that test showed that his personal bravery, steadfastness, and loyalty are to be depended upon.

But after the war came an even more convincing proof of his worth to the nation. One of the most notable exploits of our Navy was accomplished after the cessation of hostilities. It was our average officer who was responsible for the successful completion of the hazardous and stupendous task of removing the North Sea Mine Barrage. There was none of the glory of war in that operation; no foe to fight; no battles to be won. There was only the seamy side of it—hardship, discomfort, danger. It was exacting work, done under most unfavorable conditions, yet our average officer, imbued with the spirit of the thing, encouraged by the odds against him, fought on until success rewarded his efforts.

In summarizing then: our average naval officer is physically well fitted for his position, schooled by practice in the art of command, interested in mechanical advance, indifferent to war as an art and to administrative problems, enthusiastic about his profession, and capable of high courage and loyal devotion to duty in times of national emergency. As long as he retains these characteristics he may be reckoned a stalwart asset in our first line of defense, a credit to his organization, to himself, and to the nation which he serves.

DISCUSSION

Why Don't They Stay In?

(See Page 1255, August, 1923, PROCEEDINGS.)

CAPTAIN S. V. GRAHAM, U. S. NAVY.—In this article, the author states that the mission of the recruiting service is "to secure the largest possible number of mentally, morally and physically qualified men for the Navy." His next sentence is "Modern recruiting is a sales proposition."

It would appear that we acquire what we need by buying rather than by selling. I have long been of the opinion that our recruiting service has been operated under the false impression that recruiting is a sales proposition, rather than a buying proposition, and I am convinced that the Navy would obtain much better results by employing judicious buyers instead of industrious salesmen in the recruiting service.

Does the Navy Need a Naval Reserve Force?

(See Page 1419, September, 1923, PROCEEDINGS.)

LIEUTENANT COMMANDER F. A. SAVAGE, U. S. N. R. F.—From the standpoint of a Naval Reserve Officer and former Naval Militiaman, the article written by Lieutenant Commander Bogusch certainly rings true. He hits the nail squarely on the head and forcibly brings out the vital necessity of a Reserve Force. His statement, however, that "among the officers still remaining in the Reserve Force, there are excellent, good, fair, indifferent, and an abundance of dry rot members" is he says, "a sweeping statement but nevertheless true." Is such a statement any more applicable to members of the Reserve Force than to men generally, and is the proportion of graduates to entrants in the Naval Academy, or any college, greater than the proportion of men in the Reserve Force who measured up to the requirements during the war?

The Navy made a wonderful record during the war, a record of which every man who took part in its achievements may feel justly proud, and yet during the war there were in the Navy something over 400,000 reservists. Not all distinguished themselves but they did their part toward winning the war and toward the establishment of the Navy's record, and if again their services should be needed they would come back almost to a man.

It is undoubtedly true that a very large number of naval officers are interested in reserve matters, and I believe this to be equally true of the "Service as a whole" if we eliminate a comparatively small number of unthinking men, mostly found in the lower grades.

When war was declared, the Naval Militia was the only auxiliary force the Navy had. It was composed of something like 11,000 officers and men who were immediately mustered into Federal Service, some with years of training, such as it was, while many who enlisted during the winter of 1916-17, were without any experience whatever.

The Naval Militia was recognized in accordance with G. O. No. 153 and a large proportion of both officers and men had, prior to April 7, 1917, fulfilled the requirements, passed the examinations and were the proud possessors of Certificates of Qualification from the Department.

On or about July 1, 1917, all Naval Militiamen then in Federal Service were qualified by General Order, without reference as to whether they had passed the examinations as required by G. O. No. 153 or not. Poorly trained as it undoubtedly was, the Naval Militia nevertheless did give the service a number of men who proved their value. Both on shore and in the reserve fleet they trained recruits, operated bases and enabled officers of the regular service to do more important work.

The principles enunciated by the Board appointed by the Secretary in 1921 are certainly sound, and the general policy as set forth in the recommendations of the Board appointed in 1923, provide a working basis. The question of "sufficient funds" is of tremendous importance, but even with limited funds a certain amount can undoubtedly be accomplished.

Lieutenant Commander Bogusch brings out most forcibly that the only effective method of training reservists, is on ships manned by regular officers and regular enlisted men. Preliminary training on shore may be handled by reserve officers but there is no surer way to kill enthusiasm, destroy discipline, or create false impressions, than by sending reservists to sea aboard unorganized vessels. The Department has the records in its possession, and a careful analysis of the fitness reports permits an easy method of selection both in and out of the Reserve Force.

It must not be forgotten that reservists are dependent upon civil occupation for their living, and the time at their disposal for naval training is generally limited to one evening a week during the winter months and two weeks during the summer. It is obvious that training on shore can be accomplished only if training stations are conveniently located; on the other hand during the available two weeks, which usually constitutes the reservist's summer vacation, it is highly desirable that the time be employed on board modern ships at sea and not on antiquated vessels lying at anchor or tied to a dock. While this applies largely to new men, it must not be forgotten that over 400,000 men saw service during the war, a large number of whom were on active duty for nearly two years. Training under war conditions is worth many times the same length of time under peace conditions. These men were all interested in the Navy, most of them still are, and the pity is that through false ideas of economy Congress has forced the Department to make so many of them feel that the Navy has lost all personal interest in them.

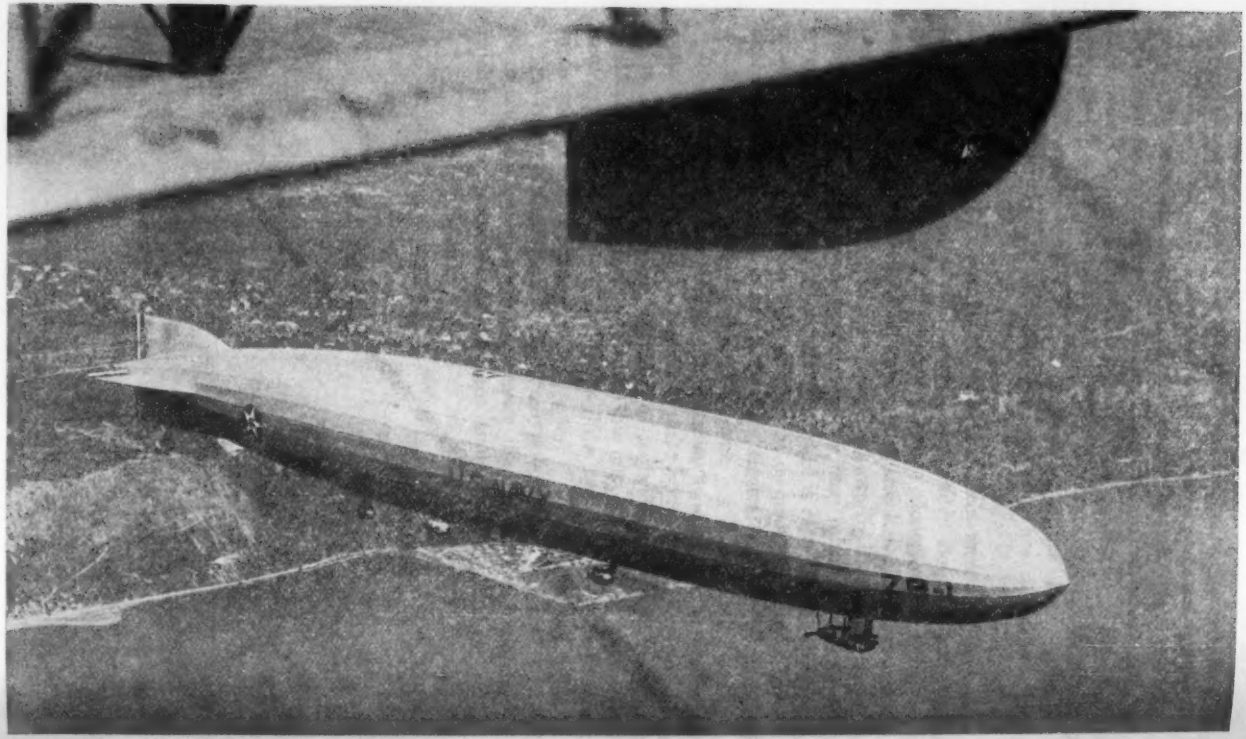
State organizations have their disadvantages, but certain points in this

connection should not be overlooked. In times of Congressional economy it should be remembered that the states furnish armories and money for both equipment and maintenance. In some states the Navy can meet this lack of armory facilities by utilizing old vessels in reserve, but the use of such vessels is impossible away from the sea coast and if reservists from the interior are to receive any training whatever during the winter, the Federal Government may find it desirable to utilize state equipment. It is quite immaterial what methods of training are adopted so long as results are obtained.

The Navy has a golden opportunity to select men who have shown a true Navy spirit, but as Lieutenant Commander Bogusch aptly remarks "the Reserve Force will not thrive on logic alone." The Department is cognizant of the vital necessity of an adequate Reserve Force and that it has been a subject very much in mind, is shown by Lieutenant Commander Bogusch's quotations and references to the recommendations of the several boards; but so long as the Department is restricted by Congressional ideas of economy, just so long will action on plans be delayed, erroneous impressions linger both in and out of the service, and just so much longer will be required to undo harm already done.

It would seem that the important question at issue is to centralize efforts in order to bring home to Congress the real value of a Naval Reserve Force, and the imperative necessity of sufficient appropriation to enable the Department to organize and train this important adjunct to the regular service. The smaller the regular Navy, the more vital become the requirements for an efficient Reserve.

The Navy is the best insurance our government has and it is always cheaper to pay premiums for insurance than to meet eventual losses for which no adequate provision has been made.



"ZR-1" on New York and Philadelphia Flight, "Shenandoah"

PROFESSIONAL NOTES

PREPARED BY

LIEUTENANT COMMANDER H. B. HIRD, U. S. NAVY

AND

LIEUTENANT J. B. HEFFERNAN, U. S. NAVY

GENERAL ARRANGEMENT

VESSELS BUILDING — Great Britain 2053
NAVAL POLICY — France 2057
MATÉRIEL — Germany 2064
PERSONNEL — Japan 2067
PERSONNEL — United States 2072
MERCHANT MARINE 2077
AERONAUTICS 2082
ENGINEERING 2088
ORDNANCE 2098
NAVIGATION AND RADIO 2104
MISCELLANEOUS 2111
CURRENT NAVAL AND PROFESSIONAL PAPERS 2120

GREAT BRITAIN

NEXT YEAR'S BUILDING PROGRAM.—Inquiries made in well-informed circles in London last week failed to elicit any confirmation of the rumors that a new naval program is impending. This is the season at which the Navy Estimates for the next financial year are usually under discussion, though they do not, of course, take definite shape till some months later. The Admiralty are not in the habit of explaining their intentions beforehand, but whenever any big development in the shipbuilding line is contemplated some indication of it can generally be obtained well in advance, and this year there are none of the signs which herald such a move. Such information as we have been able to glean suggests that the shipbuilding policy foreshadowed in the last Estimates has not yet been modified. This provides for the leisurely completion of vessels already in hand, including the cruiser-minelayer *Adventure* at Devonport and the submarine *X.1* at Chatham, and the laying down at Chatham early in the next financial year of an experimental submarine. No further construction, it appears, is proposed for the immediate future.

As regards new cruisers, the position, as explained to *The Naval and Military Record* on good authority, is briefly as follows: The Navy admittedly, is far below its proper strength in cruising ships of the commerce protection type, so much so that the outlook would justify serious misgiving if there were the least prospect of political complications arising during the next few years. As things are, however, the matter is not regarded as being sufficiently urgent to warrant immediate action. For service in home waters,

"ZR-1" ON NEW YORK AND PHILADELPHIA FLIGHT, "SHENANDOAH"

the Mediterranean, and the Near East most of the cruisers now on the Navy List are suitable enough. They are, however, too small for overseas operations, and, sooner or later, it will be necessary to build larger vessels to show the flag on foreign stations.

No Immediate Construction.—In respect to numbers the British Navy is well ahead of all the rest possessing as it does about forty-five cruisers of fairly modern design, whereas the United States has only ten and Japan about fifteen. But if further construction is embarked upon abroad, an early reinforcement of the British cruising fleet will become imperative. Ships of the type which the Admiralty have in mind would cost in the neighborhood of £1,500,000 each, so that a program of these vessels would run to a very large figure. It does not follow that our next cruisers will have the maximum tonnage permitted by the Washington Treaty, though if other Powers build up to that limit we shall probably be compelled for military reasons to do likewise.

The program for 1924-25 cannot be finally determined until the decisions of the Imperial Conference are known, as so much depends on the extent to which the Dominions are willing to assist in the naval defense of the Empire. It is no secret that New Zealand is anxious to acquire several cruisers which in tonnage, speed, and armament would be well up to the latest standard, but there are so few of these ships now available in the Royal Navy itself that none could be spared. Consequently, the impulse toward new construction may come in the first place from the Dominions. It may be accepted as certain that when the time comes to lay down new cruisers the claim of the Royal dockyards to share in the work will receive the most sympathetic consideration. But, unless unforeseen developments occur between now and the end of the year, there is but little chance that the next Estimates will contain provision for anything more than one submarine.—*The Naval and Military Record,* 12 September, 1923.

Singapore Base Utterly Foolish Says Percy Scott.—London, October 16—Opinion here regarding the proposed British naval base at Singapore is so violently divided that special interest is attached to the line the dominion premiers, especially those of Australia and New Zealand, will take on Wednesday, when the question is expected to come before the Imperial Conference. The belief prevails here that Australia favors the project and is willing to contribute toward defraying its expense, and accordingly opponents of the base are doing what they can to bring its supporters to the contrary view.

Admiral Percy Scott, who has no confidence in the utility of battleships and who is hotly antagonistic to the Singapore plan, told a meeting of the Australian Association of London last evening that the proposed base was utter foolishness. The only key to safety and defense, he said, was in the use of airplanes, mines and submarines.

If these were properly provided and properly operated a Japanese fleet could never reach Australia, nor could an American fleet reach Japan in the event of hostilities; while if Singapore were similarly equipped no hostile ships could ever get within 200 miles of that port.

The admiral said it was a wicked, wanton and wilful waste of the taxpayers' money to construct such docks at Singapore, and that the idea had originated with men who were either ignorant or too lazy to analyze the basis for their opinion.

Admiral Kerr took the same line. He asserted that a distinguished American admiral had told him that but for the shipbuilding vote the United States would scrap every battleship she was building. The present type of ship, Admiral Kerr said, was as obsolete as Nelson's wooden ships.

Secrecy still surrounds the discussion of the Imperial Conference. Questions of imperial defense were discussed, after a speech by the Duke of Devonshire.

Premier Baldwin presided, and Lord Curzon and the ministers representing the defense services were present. At the conclusion of the conference a brief communique was issued, solemnly announcing the names of the participants and stating it had been decided in view of the matters discussed that nothing should be published.—*Boston Transcript*, 16 October, 1923.

Fleet Distribution.—Over two months ago it was hinted in this journal that the fleet in the Mediterranean would in future be kept at a higher standard than was fixed when the post-war squadrons were originally constituted in 1919. Two events have just occurred which support this forecast. One is the order to move the Fourth Destroyer Flotilla of the Atlantic Fleet into the Mediterranean, where it is to replace the Eighth Flotilla of smaller and weaker vessels, just as recently the Third Flotilla was also sent there in place of the Seventh Flotilla. These changes will make the type of destroyers in the Mediterranean the largest and most powerful in the Navy. The other event is the holiday cruise to the Near East of the First Lord and his speech at Malta at a Ministers' luncheon, when he is reported to have said that the Mediterranean was now the center of gravity of naval affairs, and for a year or two the principal British squadron will be stationed there.

This is a question which will certainly be discussed at the forthcoming Imperial Conference, and it would be foolish to read into the First Lord's words an indication of an immediate or startling change. We have already in these columns shown how the reports emanating from Malta on the subject are issued merely with a view to propaganda. The trend of policy in regard to the distribution of the fleet is, however, clearly in the direction of the East, but, as with the creation of a North Sea Fleet, the various steps have to be taken gradually. The present organization of the fleets and squadrons was decided upon in principle nearly five years ago, such changes as have been made during that time being dictated chiefly by the need for economy. A revision of the plans made at the beginning of 1919 is thus overdue. It should be remembered that several factors enter into this problem of fleet distribution, which cannot be settled entirely with regard to the international situation at a given time. There is, for instance, the matter of fleet training, which, as Mr. Amery has said, is better carried out in the North Sea than the Mediterranean. During the latter part of the time that we had a big fleet at Malta it was almost always brought out into the Atlantic for the purpose of maneuvers.—*Army, Navy and Air Force Gazette*, 22 September, 1923.

Navy in the Mediterranean.—The visit of the First Lord of the Admiralty to Malta and other ports in the Mediterranean may be regarded as the first step toward the inauguration of a new scheme for the distribution of the fleet. That such a scheme was contemplated Mr. Amery indicated early this year when, in his statement explanatory of the Navy Estimates, he said a strengthening of the fleet in Mediterranean waters had been temporarily necessitated by the Near Eastern crisis, and might become desirable as a permanent measure in the future to meet the general strategic situation.

By most naval officers a change of policy on these lines has been expected. The need for keeping a strong fully-commissioned fleet in home waters has passed, and there are many reasons why we should revert to our old policy of basing our strongest fleet on Mediterranean ports. Not only

would such an arrangement facilitate the dispatch of the ships to any part of the world, but it would render possible gunnery and other exercises all the year round, although it would doubtless be considered advisable for the fleet to carry out periodical exercises in the Atlantic.

The question of docking our modern capital ships, of course, presents some difficulty, as the only docks owned by the Admiralty that will accommodate these ships are at Rosyth. For the present, the floating dock at Malta can be used for the purpose, but it is not unlikely that in the near future a scheme for building new docks at one of our Mediterranean bases will be decided on.—*The Naval and Military Record,* 5 September, 1923.

"Malaya" Only Big Warship of British Colony Left.—London, September 22.—The passing of the *Australia* from the active list of the Royal British Navy lends topical interest to the fact that the Navy has now only one capital ship built at the charge of a British dependency—H. M. S. *Malaya.*

The *Malaya* was launched in 1915 at the cost of the Federated Malay States. She is of the *Queen Elizabeth* type and carries eight fifteen-inch guns as a main armament. The scrapping of the *Australia* and her sister ship, the *New Zealand,* leaves the *Malaya* the sole representative of the British dominions beyond the seas, the last token of colonial generosity in the Empire's time of need.—*Boston Transcript,* 22 September, 1923.

Revival of British Coast Guards by the Marquis.—Although it is less than a year ago that the popular and admirable force of British seamen composed of veterans of the Royal Navy, known as the Coast Guards, under the command of Vice Admiral Sir Morgan Singer, was disbanded as a measure of economy, it has become necessary to reestablish the service and even to increase its former size. This is due to the extraordinary amount of cocaine and other drugs of an analogous kind that are being smuggled into the United Kingdom.

It has been shown that the illicit traffic in these drugs has since last March assumed a size so enormously out of proportion to the lawful importations for medicinal use as to leave no doubt whatsoever that these drugs were finding their way into the British Isles from abroad otherwise than by the regular trade routes. An investigation was quietly instituted which resulted in the discovery that they were smuggled into the country by means of rowboats, operating from innocent looking fishing and merchant craft, under the cover of the night, on lonely and remote portions of the coast.

Incidentally the fact was brought to light that a number of undesirable aliens who had been expelled from the United Kingdom by the police and who when they attempted to reenter the country had been turned back at Faulkstone, Boulogne, Newhaven, Southampton, Harwich, Hull and other Channel and North Sea ports had managed to make their way back into Great Britain by means of landing from fishing and other kinds of sailboats and even from steam yachts lying off deserted portions of the coast. A number of undesirable aliens of this kind who had got back to England by these unlawful means, blessed with more money than principle, and consequently dangerous, have been arrested and sentenced to terms in prison before being once more expelled.

All this has convinced the government of the necessity of restoration of the coast guards, who were so picturesque a feature of the seabound frontiers of the British Isles.

Up till a hundred years ago the coast guards were known as "Preventive Men," and both they and their boats were subject to the Treasury, and more especially to the Customs Department thereof. But King William

IV, who was a sailor by profession, transferred the entire force to the Navy and insisted that they should be regarded as naval reserves, and recruited from former able seamen and petty officers of the Navy.—*New York Sun-Globe,* 10 October, 1923.

AIRSHIPS AND DEFENSE.—The acceptance of the strategic value of airships by our government causes the question of Empire defense to be linked with airship development. The British Empire, with its great sea routes, is still a naval problem, and has more need of patrol vessels than any other nation. This was admitted at the Washington Conference, where no limit was put on the number of light cruisers that could be built. The only limiting factor so far as Great Britain is concerned appears to be the question of cost. It therefore appears that the existence of an Imperial airship service, with its bases on all the main Imperial routes, and a number of airships available in case of war or a crisis, would enable the state to save troop transportation costs in peace time, as well as to enable a holding or striking force to be landed rapidly anywhere.—*Army, Navy and Air Force Gazette,* 22 September, 1923.

IS BRITANNIA STILL RULING THE WAVES?—As to the question of which Power is actually supreme on the water, the best-informed Paris experts give the palm to Britannia for the following reasons. The ballistic superiority which the American armada enjoins for the present over all comers, while being a splendid asset, is counteracted by the fact that the British Navy makes up for her slight disadvantage in total weight of broadside by superiority in speed, also for cruisers. There is nothing in the American Navy that could in choppy seas escape from the *Hood, Renown,* and *Repulse* squadron (and we should have a repetition of the Falklands affair). But especially Great Britain's supremacy will rest for a long time to come on her matchless naval personnel and on her command of all important sea passages. The possession of Gilbraltar, Malta, Egypt, the Bermudas, Cape Town, and Singapore will always be worth a good many battleships.—*The Naval and Military Record,* 3 October, 1923.

FRANCE

NEW CONSTRUCTION PROCEEDING APACE.—All the ships of the Raibert's program are making good progress. The *Duguay-Trouin* that was launched weighing 3,500 tons, will this month ship her boilers that were made at Indret (Nantes), and turbines and turrets are nearing completion. She will be ready a few months in advance of the scheduled time, and hoist the pennant in the autumn of 1924. The *Lamotte-Piquet,* that is being constructed in dry dock at Lorient, is as advanced as the *Duguay-Trouin.* The *Primauguet* has just been laid down. The 2,400-ton *Jaguar* will be launched at Lorient next month, when the *Panther* will be laid down. At St. Nazaire the destroyers *Chacal Leopard* (of 2,450 tons), and the torpedo-boat *Simoun* (of 1,460 tons) are on the stocks, making rapid progress. The *Lynx* is shortly to be commenced. Two submarines will be floated before the end of the year. Most of the flotilla units will have reached the completion stage by the end of 1924, when a new French fleet, numerically modest, will be in being.—*The Naval and Military Record,* 5 September, 1923.

AERIAL BUDGET: DIRIGIBLE'S PERFORMANCES: NEW DUTIES FOR FRENCH GUNBOATS: MODERNIZING OF BATTLESHIPS OF "BART" CLASS: STRENGTHENING THE FAR EASTERN DIVISION.—The aerial budget for the Navy reaches this year 105 million francs, against thirty-seven in 1922, out of total budget of 1,028 million francs, but it must be noted that Army aviation absorbs

380 millions in 1923. New naval aerial construction comes in for forty-eight million francs, of which sum twenty-eight millions are earmarked for the command of fifty-four seaplanes, and twenty-two millions go toward the creation of aerial bases. A central base to cost twelve millions is to be established near Algiers, and other bases at Bizerta and in Morocco.

Everything is apparently being done to prepare public opinion for a dirigible program to be submitted to the Chamber next November. The rather poor performances of French dirigibles and the sensational disasters that befell German dirigibles at the hands of French gunners and aviators had prejudiced the French "man in the street" against gasbags. But, as a consequence of the truly remarkable performances of the two French ex-Zeppelins, the opinion is fast gaining ground that communications with Algeria, oversea scouting and night bombardment of hostile arsenals can be best assured by a strong dirigible force. Both the *Dixmude* (65,000 cubic meters) and the *Mediterranée* (25,000 cubic meters) gave satisfactory results during their recent cruise over the Mediterranean Sea, despite untoward sea conditions. The *Dixmude* remained in the air for seventy-two continuous hours, and covered over 4,000 kilometers, passing in turn over Algeria, Tunisia, Sardinia and Corsica and regained its hangar at Cuers near Marseilles, on September 3 in the early morning. The crew were delighted with the performance of the aerial vessel, that is all the better for the modifications it received at the hands of French specialists, who for the last two years, under the direction of Admiral Lanxade have been at work with the problem of the rigid and semi-armored dirigible.

The *Bapaume*, that had a serious breakdown off the coast of Sardinia, as the result of condenser trouble, is a seaplane-carrying gunboat belonging to a series that comprises twenty-two units, all named after famous battle-fields of the Great War. (At Bapaume both British and French fought and conquered.) There is no counterpart in the British Navy to the *Bapaume* type, that has the outward appearance of a small cargo vessel, deeply laden with low freeboard amidships. French naval men have but little esteem for the design of those 850-ton avisos that are too narrow for their shape, catch the wind marvellously, roll heavily, and are lively in a seaway. Their speed varies from 13 knots in heavy seas to 20 knots in smooth water. Relatively to their displacement they mount the most powerful armament of all gunboats; viz., two 5.7-inch weapons, with a range of 17,000 meters, besides anti-aerial guns, and under favorable conditions they would be a match and more, for the largest submarines and also for the largest destroyers.

In this bright picture, unfortunately, there is a dark corner; that fine armament cannot be used end-on, and, being somewhat low in the water, neither can it be used to advantage in very heavy weather. Still French *officeirs de vaisseau* with a philosophical turn of mind have persuaded themselves that plenty of good is to be got out of the *Bapaume* class for coast defense, anti-submarine operations, and even for scouting. By bridging over the gap between the fore and the central castle, room can be found for two scouting planes, and this quite comfortably. In ordinary seas, and in the Mediterranean more specially, the seaplane-carrying *Bapaume* can render all the greater services as they represent few eggs in the basket. In the "Kriegspiele" of the *Ecole Superieure de guerre*, where war operations are being repeated with actual instruments of offense, it is generally found that fast, heavily-armed, and seaplane-carrying gunboats of 800 tons are ideal weapons of distant blockade as well as of harbor defense.

A *fait nouveau* in warfare is the fitting of seaplane platforms in gunboats and old cruisers, that are thus rendered good for scouting and even for offensive actions in co-operation with submarines, which they can both guide and protect against attacks by destroyers, as has often been

shown in recent maneuvers in the Mediterranean. Small seaplanes of the Spad, Nieuport, Hauriot, and Levasseur (torpedo-plane types have been designed for eventual installation on board cruisers and gunboats, the offensive worth of which is thereby considerably increased.

The 24,000-ton *Jean Bart*, a contemporary of the now discarded British *Orion*, is to undergo refit and extensive modifications at La Seyne, the work in her to last up to next spring, when she will be commissioned anew with the battle fleet. Her sister ship *Paris*, that has been similarly refitted at Brest, will take her place in commission, so that the Dumesnil squadron will include five battle units, all modernized: viz., *Bretagne, Provence, Lorraine, Paris,* and *Admiral Courbet*. The intention is to keep five ships in commission, one in reserve and undergoing refit, with a review to having all six ships in perfect fighting trim in readiness for emergency. It is even said that Admiral Dumesnil prefers having only four ships under training at sea, and two being repaired or improved in harbor, in keeping with the teachings of war. Admiral de Lapeyrère, it is remembered, paid heavy penalty for his anxious desire to have all available battleships ever at sea in commission. When war flashed upon him he was strategically handicapped by having three or four lame ducks among his eighteen battleships, one of which, the *Mirabeau*, proved unable to crawl at 10 knots. The great British Home Fleet, it will be remembered, also suffered from similar causes. Admiral Dumesnil wants no more make-believe policy, being quite exempt from that childish vanity which causes so many commanders to jealously grab the most they can of ships and men and to proudly array them under their sway: *Mes hommes, mes vaisseaux!*

The *Jean Bart* will receive improvements and be in several ways a new ship some eight months hence. Her motors will receive special attention, and it is expected with oil fuel she will be able to retrieve her trial speed, which was over 22 knots with 42,000 h.p. (instead of 29,000). There may be mentioned here the strange discrepancy in the speed results given by the same nominal motor-power in the French Dreadnaught class. The *Courbet*, fitted with the inferior Niclausse boilers (the extremely poor performance of which gave rise to an indignant indictment by Admiral Bienaime in the Chamber), could not exceed 20.8 knots, gave no end of trouble, and at sea is inferior by two knots to the *Bart*—which caused her before the loss of the *France* to be attached to the Toulon Gunnery School. But the *Paris*, that has Belleville boilers like the *Bart*, though satisfactory, only developed 35,600 h.p., and could not exceed 21.6 knots, which is poor when compared with the *Bart*. Compared with British dreadnaughts, the *Bart* and *Lorraine* classes give a rather low return for their motor-power, though they are all good for 20 knots at sea as the result of the care in keeping their motors in good condition. More money is being spent in upkeep and repairs than ever in the French Navy. "Better spend lavishly on upkeep, and have every unit at top fighting worth in case of an emergency!" Such is the new policy.

Owing to the change of the situation in the Far East and to the need of a cruiser force with large radius of action capable of visiting in turn French possessions in Asia, as well as Madagascar and New Caledonia, the Division *Navale de l' Extreme-Orient* is to be placed on a pre-war footing and to include the 12,600-ton *croiseur-suirassé Ferry*, mounting four 7.6-inch and sixteen 6.5-in. guns, protected by a wide and continuous belt from three to seven inches thick, recently reboilered; the 9,500-ton *croiseur-cuirassé Montcalm*, mounting two 7.6-inch and eight guns of 6.5, besides six 4-inch weapons, and the ex-Boche 4,300-ton scout *Colmar*. The sea speed of the division is hardly equal to 19 knots. The fighting value is superior to that of modern light cruisers, the *Ferry*, for instance, having a crushing superiority over a *Hawkins* or an American *Omaha*. But, of course, a single battle-cruiser of the British or Japanese type would with

impunity make short work of the whole division, which is little more than a flag-showing force and has as best weapons the few seaplanes it will carry. The commander, Admiral Frochol (fifty-two years of age), has seen war service in the Adriatic as chief of the Brindisi Flotilla group, where he had much to do with his English and Italian colleagues, and since he has been *attaché naval* at Rome. The *Hugo* and *Michelet, croiseurs-cuirassés* of 12,600 tons, are fitting anew for either a flag-showing cruise or for incorporation with the battle fleet, should events require it.—J. B. Gautreau, *The Naval and Military Record*, 12 September, 1923.

GROWING STRENGTH OF FRANCE IN THE MEDITERRANEAN: WAR PERFORMANCES AND POSSIBILITIES OF THE DIRIGIBLE: GOOD AND BAD POINTS OF HEAVY COASTAL BATTERIES: BALLISTIC EXPERTS VS. NAVAL MEN.—The command of the Western Mediterranean is the main preoccupation of the Paris Admiralty in order to prevent enemy ships with impunity using those waters in *Goeben-Breslau* fashion. Strenuous and realistic training, new long-range shore batteries, new seaplane and submarine flotillas, new long-range appliances in battleships made as torpedo-proof as possible—such are the means to that end, together with an elaborate system of detection and signalling stations. Numerically weak for ballistic contests, the Mediterranean *escadre de combat* is efficient for the new conditions of warfare. It is even hinted that under the new war conditions, when victory depends no longer on the leadership of the sole battleship force, but on the skilful and simultaneous handling of flotillas dispersed over a vast area, the right place for a Commander-in-Chief is in the air, on board a small (little vulnerable) and fast dirigible fitted with up-to-date wireless and signalling appliances, having a view over the whole battlefield. The intention is to test in forthcoming maneuvers the practical worth of that idea. But it goes without saying that if that epoch-making innovation is adopted, plenty of training and signalling on new lines will be necessary before it is workable.

The *Dixmude's* seventy-two-hour continuous cruise, with its forty-ton carrying-power, available for troops or ammunition, should convince Admiralty experts that France possesses at last the reliable instruments of prompt communications with Algeria in war time—large squadrons of helium-filled dirigibles going sixty miles an hour, crossing in seven or eight hours during night-time; and, slower but safe also, submarine flotillas crossing in thirty hours. Colonial defense, it is felt, has made great strides. It is noted that German Zeppelins during the war remained in the air much longer than the *Dixmude*. A Zeppelin started from Bulgaria in November, 1917, with medical supplies for the relief of the German force in East Africa, and proceeded beyond Khartum when a radio message recalled her because of the surrender of the German mission. The round trip took 107 hours, and 4,800 miles were covered without a stop. A Zeppelin reconnaissance trip over the Baltic lasted 120 hours.

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Coastal defense is being organized on practical footing all along our coasts. Long-range (sixty kilometers) 450-mil. guns defend the approaches to Toulon, and are also to protect the Dover Straits, Brest, and Bizerta, in conjunction with 340 and 305-mil. batteries that are already installed. This artillery defense is being constituted on scientific lines. Range is of no use without adequate means of detection and of locating enemy ships, especially by night; and so lighting shells and bombs, as well as aerial searchlights, are being improved by constant experiments. Special shells with tremendous exploding and asphyxiating power are made to burst on striking the water, so that no projectile be lost that happened to fall near the target. Fire-director's tactics are used in launching salvos of four guns

over an enemy; and it is believed no super-dreadnaught would survive the greeting of four projectiles of 1,500 kilos (18-inch caliber), or even of four of 600 kilos (13.4-inch caliber). Sighting appliances, so long neglected in the French Navy are the object of special studies. On the other hand, various camouflage devices are being prepared to prevent enemy seaplanes detecting our heavy coastal batteries, that are, besides, to be made proof to bombing.

Thus, enormous strides have been made since the war, when inferior Army guns, with a range of 9,000 meters, and so-called *obus-torpilles* Perruchot without much value were the only coast defense and all French harbors could have been bombarded with impunity from the high sea. To-day the radius of action of long-range batteries *cotières*, supported by guns on rails or trucks, have been so well calculated and provided for that bombardment by battleships and cruisers or landing on the French coast would prove operations extremely risky. The drawback of this comprehensive organization is its high cost in money and also in men. Ballistic experts are enthusiastic, but not so naval men, who by training are believers in the value of offense on the high sea. The latter remark that all that brick and mortar or cemented armor policy, all that inert defense, is nothing but make-believe, would be powerless to ensure safe communications with French colonies, and is in reality a source of weakness, absorbing finances that could be and ought to be employed to better advantage. They consider that under-water and aerial flotillas, ever in progress in the matter of training, are the only defenses that count for the French coasts, and mostly because they are in reality mobile offensive forces possessing radius of action sufficient for work in narrow seas.—J. B. Gautreau, *Naval and Military Record*, 19 September, 1923.

North and South "Escadre de Combat" Reorganized: "Dixmude" Dirigible to Accomplish a War Test: Ministerial Efforts to Obtain Long Service Men: Great Britain's Superiority: Air vs. Sea Power.—Rear-Admiral Docteur's *Division de la Manche* comprises the battleship *Diderot*, of 18,000 tons and 18.5 knots; the *Voltaire*, refitting at Lorient (five months' work); and the *Condoret*, with nucleus crew on board. These three old battleships have received modifications increasing their range, and their improved under-water caissons make them proof against two or three torpedoes. The attached flotilla comprises eighteen destroyers of 750 to 910 tons and 28 to 35 knots. The *Gabolde*, the last Normand-built *torpilleur d'escadre*, laid down in 1913, is still undergoing trials. Over twenty submarines based on Brest and Cherbourg would support that meager squadron. At Toulon Admiral Dumesnil has expressed satisfaction with the condition of the 24,000-ton *Provence*, *Bretagne*, *Lorraine*, and *Paris*. Both the *Courbet* and *Bart* are to be extensively modified. The attached flotilla comprises only thirteen destroyers.

The *Dixmude* dirigible (65,000 cubic meters) has left on a 4,500 war test over Morocco and Senegal, the results of which will determine the French aeronautical program.

The question of short or long term naval service is again on the carpet as the result of recent experiences with young recruits incorporated under the eighteen months' or two-year conscription law. It is barely possible in that short time to transform the raw recruited material into an efficient fighting machine, and it is perfectly intolerable for naval constructors to see every year efforts and money expended on training recruits reduced to naught when our young "marins," on the completion of their legal term under the flag, say goodbye to the service. Our officers would not be human, if so wasteful and senseless a system had no cooling effect on their enthusiasm. As a matter of fact, many are becoming "blasés" and indifferent to results, regretting olden times, when Inscription Maritime

instituted by the great Colbert kept Brittany sailors five and six years at a stretch on board; and envying the long-term system that is at the root of British maritime superiority. They wax sarcastic when they are told that sacred *egalité* stands as an insuperable obstacle to the establishment of different conscription laws for sea and land; and they recall that the last great war at sea has been won by the long-term service men of Old England.

It is a pity our *distingués deputés* and *Senateurs,* before voting for laws on which depend the security of the country, are not given some little tossing on the choppy waters of the Bay of Biscay, just to convince them that fighting on the water is a totally different affair from scrambling over the steady *plancher des vaches.* Minister Raiberti, who has now been twenty months in office and is taking to heart his responsible functions, is coming round to that line of thinking and making efforts to gradually transform the French Navy into a long-term service by the granting of extra-annual pay (up to £60) to naval specialists willing to re-enlist. Gunners, torpedo, submarine, and aerial experts, as well as mechanicians, are specially favored under the new rates of pay. Seamen remaining fifteen years and over in the fleet will be paid a life pension and given preference for civilian employment under the state. It will be found that that system, costly in appearance, is in the end cheaper than the wasteful short-time conscription service, and will promote something that is cheap at any price: viz., superior efficiency.

It is doubtful if voluntary re-enlistments will be numerous enough to enable the French Navy to do without short-time conscripts. This year 2,400 recruits at first intended for the Army were incorporated in the fleet, mostly in the stoking and mechanician branches. There are, besides, on board duties that can be satisfactorily performed without need of a long apprenticeship. Moreover, the recuperated provinces of Alsace and Lorraine are sending to the fleet a reliable contingent of engineers, who are free from that Bolshevist taint which it is desired to keep out of the naval service, with a view to avoiding a repetition of the Black Sea rebellion. The cruisers *Metz, Strasbourg, Mulhouse, Colmar* and *Thionville* have on board many seamen originating from the cities bearing those names. The *Ligue Maritime* is very active in Alsace-Lorraine and recruiting prospects are said to be bright. The recuperation of those lost provinces is turning out to be a good thing for the Navy in more than one way as it means, besides reinforcements in personnel, oil fuel, coal, and cheap steel, besides a flotilla of gunboats on the Rhine.

The propects of a naval pageant at Spithead, to be held in November next, have aroused much interest in Parisian naval circles, where two much-debated questions are ever *à l'orde du jour;* viz., whether the influence of sea power in the world's affairs is really declining, and whether "Britannia is still ruling the waves" and maintaining her traditional superiority over all comers. The main argument is that the air factor is bound to exercise a preponderating influence in European warfare, and that no amount of maritime supremacy can make up for inferiority in the air. In the light of war teachings neither naval nor aerial fleets can conquer: viz., capture positions on land; but a contention that can hardly be controverted is that aerial forces of offense can destroy further and more extensively, and with less risks, than sea battle squadrons. It is no secret that *avions de transport,* true aerial *troopships,* are being studied with a view to landing troops and full-equipped machine-gun sections on enemy territory, and that great possibilities for offense exist in that direction.

On the other hand, it is pointed out that a man-of-war, capable of fighting in all weathers, is a more reliable *instrument de combat* than flying machines under actual conditions of scientific developments. A battleship represents a certainty, a sure investment, available all over the

world for twenty years to come and more; the larger seaplane and even the dirigible represent a mere possibility, precarious in build, ephemeral in duration, and only good for pinpricks. Those enthusiastic admirers of air power generally only see one side of the medal: viz., the paper achievements of flying machines, whilst they totally ignore the progress of anti-aerial defense, a new science perhaps more studied in Germany than anywhere else, as show the many tricks played on French avions flying over Boche territory.

In France new anti-aerial guns with novel projectiles controlled on up-to-date principles are doing wonders. The unhappy aviator, whichever side he throws himself, by night just as by day, finds himself blinded and a target for showers of bewildering and smashing chemical projectiles. In the last war Boche aviators disliked the ordeal of crossing the artillery barrages protecting Paris, and usually turned tail, dropping their bombs anywhere before reaching the Gay City. In the next war no aviator could undergo twice the ordeal of flying through the artillery barrage defending a camp retranché (Paris or London) against aerial incursions. Such, at least, are the views of the experts of French anti-aerial defense.—J. B. Gautreau, *The Naval and Military Record*, 3 October, 1923.

New French Cruiser.—The new French cruiser *Duguay-Trouin* was launched at Brest, last month, in the presence of M. Raiberti, Minister of Marine. In a speech on the naval policy of France, M. Raiberti refuted the theory that light cruisers such as the *Duguay-Trouin* are no longer useful, wires the Paris correspondent of the *Times*. The modern fleet, he said, consisted of two distinct elements—ships of the line and light craft. The experience of the war had proved beyond question that battleships of the line could no longer put to sea and fight without the co-operation of a number of satellites, such as light cruisers, destroyers and torpedo boats, to act as scouts and to protect them against the attacks of torpedo boats, submarines and aeroplanes. France had begun the reconstitution of her Navy by building light cruisers for two reasons. The first was that, having regard to the cost of battleships, the resources of France would not permit of her building ships of the line and light craft simultaneously. The second was that France already possessed a squadron of the line which would, when modernized, hold its own for some years to come, whereas she lacked a modern light fleet.—*Army, Navy and Air Force Gazette*, 8 September, 1923.

French Air Force Plan:—Under a bill now before the French Parliament, the French army air service would comprise the following tactical formations on peace footing: 132 combat (pursuit and bombing) squadrons; seventy-six observation squadrons; eighteen balloon companies; eleven meteorological companies; fifteen companies of riggers and fitters.

The strategical organization provides for two air divisions. The five anti-aircraft artillery regiments which have recently been attached to the directorate of artillery will remain in this status.

A bill providing for the reorganization of the French naval air service is also before Parliament. This bill provides for a peace strength of fifty plane squadrons and groups of kite balloons and airships, the number of which would be determined by the Minister of Marine. The fifty squadrons would be organized in five divisions, four being provided for coast defense work, and one for fleet duties. Under the organization tables several plane squadrons and balloon groups would form a naval air flotilla, and several flotillas a naval air division.

The bill provides for reserve equipment sufficiently large to keep the organization permanently in full strength. In addition to this normal reserve, there would be constituted a "special engine reserve" which would

number three times the aircraft engines in actual use in the peace time formations.

Aircraft reaching obsolescence would be replaced in time to keep the formations constantly in a state of efficiency, and provisions for such replacements must be made twelve months before the aircraft reaches its "normal utilization limit."

For the operation of this naval air force it is contemplated to establish one central air base and four frontier air bases, in addition to instruction centers and auxiliary air stations. With the exception of the last named, all shore organizations of the naval air force would be on active status in peace time. The equipment required for organizing the auxiliary air station in case of war would, however, be provided for in peace time.

The personnel of the naval air force would comprise in peace time fourteen aviation battalions and two balloon and airship battalions.—*Aviation*, 10 September, 1923.

GERMANY

SIGNIFICANT EVENTS IN RUHR AND BAVARIA.—London, September 26.—As these lines are written the official message from Berlin announcing the cessation of passive resistance in the Ruhr still hangs fire, but is momentarily expected. After Chancellor Stresemann's statements during the week-end it is impossible to doubt the imminence of surrender.

The application of this word to Germany's climb-down in the Ruhr affair causes intense annoyance to the comparatively few people here who have championed the German cause. That they form a minority of the British nation, and a small minority at that, is, I venture to assert, a well-established fact.

Some of your able correspondents in Europe have expressed a contrary opinion, affirming that the sympathy of the British public as a whole is with the Germans in their gallant struggle against French militarism. But one has only to mingle with the crowd to notice the almost entire absence of any tenderness for Germany. Perhaps one person in ten would have welcomed the discomfiture of French policy in the Ruhr, though I believe that to be too liberal an estimate.

The press is not altogether a reliable guide in this matter. More than one British newspaper—the *Times* being a prominent example—has executed a volte-face on the subject of reparations during the past year or two, and a change in proprietorship has not invariably been the cause.

But the pro-French journals are still in the majority, while it is an open question whether those which back the German side have not suffered in prestige and circulation.

There seems to be an impression abroad that the British Administration would have taken definite action to support Berlin against M. Poincaré but for the "die-hards" of the Conservative party, who threatened to bring about a fatal split in the Cabinet if Mr. Baldwin adopted this policy.

I cannot say whether that impression is well-founded or not, but it must be repeated that had the Premier taken any active steps calculated to embarrass the French he would have acted in opposition to the will of the nation. Bankers—though not all of them by any means—manufacturers, who have a special stake in the Central European markets, "intellectuals" and certain labor politicians form the bulk of the pro-German school in this country. Together they wield considerable influence in politics and journalism, but few of them are intimately in touch with popular feeling.

Wherever plain citizens congregate, in the morning train to town, in the non-political clubs, and in the streets, you will hear expressed an all but unanimous desire that Germany shall be made to pay. This sentiment is practically universal so far as the common folk are concerned, and though many of them regularly read newspapers which are anti-French

in tone, this is one of the few subjects on which they maintain complete independence of thought.

As I have frequently stated in this correspondence, the only argument that is against France which carries any weight with the man-in-the-street is that the occupation of the Ruhr and the drastic treatment of its inhabitants may stimulate the nationalist movement throughout Germany, thus planting the seeds of a future war.

That, in my opinion, has always been the real danger, and it is serious enough to make one very critical of M. Poincaré's methods, however much one may admit the absurdity of expecting Germany to pay her debts with compulsion.

But Germany's refusal to pay is, after all the crux of the matter. Years of Interallied squalling and vacillation fortified her resolve to fight the Treaty of Versailles tooth and nail. Never from the first did she intend to obey its clauses of her own free will, though she would have made a genuine effort to observe them had she believed that default would entail severe penalties. It was the unfortunate symptoms of disunion among the Allies, and particularly between England and France, which had become manifest even before the treaty, that induced Germany's rulers to embark upon that fatal policy of subterfuge and evasion which they have consistently pursued ever since.

The financial terms of the treaty may have been onerous, but it remains to be proved that they were beyond the capacity of Germany at the time they were imposed. Mr. Keynes, Signor Nitti and other authorities think they were, but many European economists of equal distinction are just as certain they were not.

Be this as it may, Germany has never made an honest attempt to meet them. Lacking the will to pay, she has convinced herself by the Coué method of auto-suggestion that payment is beyond her power.

She has cash in abundance for everything else. State disbursements on public works and subsidies to industry have been on a most lavish scale since the peace; two and a half million tons of shipping have been built or bought outright; harbors, inland waterways, hydro-electric plants and many other vast enterprises have been developed with scant regard to cost.

And until the French laid rude hands on the very nerve center of the industrial system the German people were, if not exactly prosperous, at any rate fairly well off. There was next to no unemployment, and all classes save certain professional workers, *rentiers* and small pensioners were able to live in reasonable comfort.

The cost of subsidizing passive resistance in the Ruhr has been heavy but Herr Stresemann's declaration that inability to continue financing this movement has led to the surrender will deceive none but the simple. Resistance has been abandoned, not because it was costing more than the state could afford, but because its futility was belatedly recognized.

All the fine talk of holding out to the last gasp, all the dramatic reiterations of "the German 'No,'" all the theatrical speeches about "martyrdom before slavery" were meant for foreign consumption.

The late Chancellor Cuno came into office on the anti-reparations platform. He was assured by Herr Stinnes and other commercial magnates, whose visits to London had given them a totally false impression of British sentiment, that if matters reached a crisis and France invaded the Ruhr, British intervention could be reckoned with as a certainty. There is, unfortunately, reason to believe that Cuno had received equally misleading assurances from British sympathizers.

Accordingly, he thought it safe to trifle with and defy France, a course that was, in fact, strongly urged upon him by the super-clever officials of the Berlin Foreign Office, who saw in what they regarded as the impend-

ing collapse of the Anglo-French entente a certain guarantee of Germany's salvation.

Once again, therefore, a policy of intrigue and chicanery was deliberately adopted in preference to one of straight-forward dealing. Germany's persistent refusal to realize that honesty is the best policy lies at the root of nearly all her post-war troubles. Her present plight conveys a moral which all governments would do well to mark.

Resistance in the Ruhr having been abandoned, speculation is rife as to subsequent developments. Months will be needed to put the machinery of that complicated industrial system into full working order after the serious dislocation it has suffered, but since the German magnates have a vital interest in getting back to full production as speedily as possible the task of reorganization may be accomplished in less time than is anticipated.

It is pretty clear, however, that until the huge arrears of reparations material due to have been made good, France will not permit German industry to benefit by the resumption of normal working conditions in the Ruhr.

Meanwhile the center of dramatic interest has suddenly shifted from Essen to Munich, where the forces of reaction seem to be on the brink of some spectacular coup. For the past three years the Bavarian capital has been the main stronghold of German militarism. Here are the headquarters of all those illicit fighting corps which sprang into existence during 1919-20.

The "Orgesch" (*Organization Escherich*) and the "Orka" (*Organization Kanzler*) were ostensibly disbanded long ago, but they continue to flourish under other labels. Similarly the *Einwohnerwehr* has been merged into various citizens' corps without losing a fraction of its strength or military character.

Even Allied control officers, who usually minimize the significance of these German "secret armies," agree that in and around Munich alone there are 350,000 trained troops who take their orders from a central authority, drill regularly in battle formation and are fully equipped with uniforms, rifles, machine guns, artillery, and flame-throwers. Ex-Crown Prince Rupprecht is now the all but openly acknowledged head of this clandestine army, with Ludendorff and Admiral Scheer as his devoted lieutenants.

That these two ultra-Prussian officers should be closely identified with the Bavarian plot is quite enough to disprove the theory that its sole purpose is to establish Bavaria as a kingdom entirely independent of Prussia. No doubt the restoration of monarchial government is a leading motive, but Rupprecht and his henchmen have a more ambitious object in view. They seek to overthrow the republican system everywhere in Germany, to restore Hohenzollern imperialism, and after that to moblize the united forces of the Reich for a war of revenge.

To reveal their full hand at this stage would be premature, for German labor outside Bavaria is still hostile to monarchism, and unless the workers had been won over beforehand, even the best-planned Putsch would surely fail. But in Bavaria itself conditions are more favorable. Labor there seems quite ready to welcome a return to kingly rule, and if resistance were offered in quarter the monarchists have more than enough troops to crush it.

It would therefore surprise no one who keeps abreast of German affairs, if in the course of the next few months, perhaps even of weeks, Bavaria were to cast off the cloak of pseudo-republicanism which has grown so threadbare and emerge once more as a full-dress monarchy. But since, if Rupprecht and his backers adhere to their present program, this would involve a total repudiation of the Versailles Treaty so far as Bavaria

was concerned. France could scarcely be expected to remain passive in face of such a development.

In Parisian military circles it is assumed as a matter of course that the immediate sequel to a successful monarchist coup in Munich would be a French advance into Bavaria. This action would be at least as justifiable on moral grounds as was the occupation of the Ruhr—more so, perhaps, because if militarism regained the upper hand in Bavaria there would be serious danger of its spreading to other parts of Germany and eventually resuming its former sway over the whole Reich, to the certain peril of world peace.—Hector C. Bywater, *Baltimore Sun*, 11 October, 1923.

READY TO RAISE FLEET GERMANS SCUTTLED.—London, October 1—Two months' preparatory work by deep-sea divers at Scapa Flow have paved the way for the early raising of the first of the twenty-nine German destroyers sunk by Admiral von Reuter's orders in June, 1919.

A report received from Thurso said that the actual work of raising the ships can proceed as soon as the lifting apparatus which the Government is leasing to the salvage company arrives on the scene.

The vessels are being raised entirely as a commercial proposition by the salvage company, which expects to realize a profit from the material thus obtained. The British Admiralty announces it has no interest in any construction or ordnance secrets the sunken ships may hold. The total tonnage in the German ships at Scapa Flow is 416,000, but it is considered impracticable to raise the larger craft.

Divers who have examined the destroyers about to be raised report that their sides are wreathed in seaweed, while the decks are a jungle of submarine flowers and foliage.—*Boston Transcript*, 1 October, 1923.

JAPAN

JAPANESE POLICIES IN LIGHT OF DISASTER.—London, September 20.—Japan, through no fault of her own, has experienced a disaster the like of which has never been paralleled in modern times. Her losses in life and property are incalculable, two of her greatest cities have been leveled to the ground, and suffering and distress are so widespread as almost to defy relief. The social and economic life of the nation has been thrown out of gear.

However energetically the Japanese people may apply themselves to the task of reconstruction, it will be several years before they have repaired the havoc of this appalling visitation. Meanwhile, in every civilized community of the world, money is being freely subscribed for the benefit of the victims.

For the time being political differences have ceased to count. Those nations which discerned a real or an imaginary menace to their interests in the growing puissance of Japan have been the first to rush to her aid, now that she is stricken to the heart. One touch of tragedy has made the whole world kin.

The first ship to dash into Tokio harbor, while the city was still being racked with earth tremors and swept by flame, was an American destroyer, bringing food and medical supplies for the afflicted inhabitants. These universal demonstrations of sympathy have profoundly touched Japan, creating such an atmosphere of mutual good will that an optimist might be tempted—though rashly—to declare that "the Far Eastern question," with all its disturbing possibilities, had been eliminated forever.

It is with no wish to strike a discordant note that I propose to offer some comment on an article by Mr. K. K. Kawakami, the well-known Japanese publicist, which appeared in *The Sun* of September 4. Due to the revulsion of feeling caused by the magnitude of Japan's calamity there

is a not unnatural tendency to view her past conduct in an indulgent light. It is even suggested in some quarters that there never was the least foundation for the strictures passed upon her interpretation of the Washington treaties.

Mr. Kawakami seizes this opportunity to make a sweeping repudiation of all recent charges concerning his country's naval policy, and so admirably does he put his case that it has doubtless carried conviction to many readers. Nevertheless, as one who has from time to time criticized certain aspects of that policy, I feel bound to point out several faulty links in Mr. Kawakami's chain of reasoning. Truth is truth, and it is doing no real service to Japan to gloss over the less favorable features of her recent proceedings.

It might be better to ignore them were it certain that her naval ambitions are a thing of the past. Postponed they may be, but have they been definitely given up? Time alone can show. Mr. Kawakami broadly hints that the critics of Japan made baseless insinuations with the object of estranging her from the United States. I do not think he means that suggestion to be taken seriously, but in any case it can best be refuted by giving chapter and verse for these "insinuations."

Briefly, the indictment was that Japan, having agreed to limit her capital ships, was prejudicing the cause of real naval disarmament by developing other types of war craft on a much larger scale than her actual requirements demanded. Official facts and figures substantiating this charge have frequently been given in this correspondence and, therefore, need not be repeated here.

There is less occasion to do so because Mr. Kawakami has set out quite accurately the pre-conference and post-conference shipbuilding programs of his country, relying on the contrast between them to furnish the strongest evidence of good faith in observing both letter and spirit of the treaty.

We need only, therefore, concern ourselves with the totals. He states that, although the treaty placed no restriction upon the building of auxiliary ships, "Japan looked at the treaty in the light not of its letter but of its spirit, and decided upon as radical a curtailment of the building program of auxiliary vessels as the reduction of 'capital ships.'" Let us see what this radical curtailment amounted to.

Under the famous "eight-eight" program sixteen capital ships were to have been built. Of these Japan consented to scrap fourteen—a truly stupendous sacrifice of power, as everyone admits, even though many of the ships were only in the designing stage.

Under the same program there remained to be built ninety-two auxiliary vessels. It was decided to proceed with only fifty-four of these and thirty-eight were accordingly dropped. But—and this is the point to be noted—the fifty-four remaining ships were in each case redesigned to much larger dimensions, so that the net reduction in aggregate tonnage was only 13,395 tons. Consequently, what was lost in quantity was to a great extent made up in quality, and there can be no serious comparison between this relatively small cut in the auxiliary program and the sacrifice of fourteen capital ships.

But since Mr. Kawakami is perhaps not versed in naval technique he overlooks the true significance of his own figures. In drawing up her original auxiliary program Japan had in mind the requirements of the great battle fleet that would eventually have materialized had the "eight-eight" scheme been carried out.

A well-balanced navy needs its proper complement of cruisers, destroyers and submarines, and the number of these it was proposed to build was proportionately the number required to round off the huge battle fleet then contemplated.

Now if Japan, as Mr. Kawakami affirms, wished to give effect to the

spirit of the treaty she would surely have reduced her auxiliary program *pari passu* with her battleship program, since the one was conditioned by the other.

Instead, however, of doing this she contented herself with dropping 13,395 tons of auxiliary shipping—corresponding to the displacement of two small scout cruisers—and simultaneously prepared to build all the remaining craft to greatly increased dimensions, besides antedating by twelve months the period at which all were to be in service. The plans of cruisers first projected as 6,000 ton ships were redrafted on the basis of 7,000 to 10,000 tons; several hundred tons were added to the weight of each destroyer, and the new submarines were redesigned as big ocean-going boats of considerably augmented displacement.

In other words, although the great battle fleet which alone justified this auxiliary program had been canceled, the program itself was substantially adhered to, with the result that Japan was building auxiliary craft greatly in excess of the ratio of strength imposed by the treaty. In doing this she was not, it is true, infringing the letter of that compact, but was she observing its spirit? I think that question admits of but one answer.

Mr. Kawakami brands as "an absurd insinuation" the statement that Japan, before going to the Washington Conference, had completed naval bases and fortifications at the Bonin Islands, thus placing herself in an advantageous position to propose to the other powers that all naval bases within a certain area of the Pacific should be left *in statu quo*.

He even goes to the length of declaring that there is not "a single naval harbor, a single fortification, even a single gun anywhere in the whole group."

On this subject his information appears to be at fault. The fact that the Bonin Islands were being fortified was first revealed by the Japanese press in 1921. On May 12, 1921 the Osaka *Mainichi* wrote: "Following the fortification of the Bonins and the establishment of branches of the Fortifications Department on Amami Oshima and Yajima in the Luchus, the naval authorities now contemplate the building of a port of call for warships and an aerodrome at Miyakejima, an island off Idzu Province."

Furthermore, the Japanese Foreign Office, in a communique dated February 22, 1922, stated that "in conformity with the spirit of this provision (*i.e.*, Art. XIX of the treaty), the Japanese Government have decided forthwith to discontinue work on the fortifications in the Bonin Islands and Amami Oshima." As this work had been commenced in February or March of the preceding year, it is reasonable to assume that considerable progress had been made with it in twelve months.

Mr. Kawakami is apparently unaware that in November, 1921, festivities were held at the Bonins to celebrate the completion of the fortifications, a fact announced at the time in the *Japan Chronicle* and other journals.

Although the precise nature of these defenses is, of course, a Japanese military secret, there is reason to believe they include heavy artillery at Futamiko, the principal harbor in the group, with operating facilities for submarines and aircraft.

Not only had Japan an unquestionable right to fortify these islands, but she showed sound strategic judgment in doing so, for in a defenseless condition they were liable to be seized by an enemy and exploited as a base for attacks on the Japanese seaboard, situated only 500 miles distant. That the work should have been completed on the eve of the Washington Conference was a coincidence which naturally excited remark, especially when it became known that the Japanese delegation attached greater importance to the preservation of the *status quo* regarding naval bases than to the limitation of ships, and had made it clear that without a preliminary agreement on this point they would be disinclined to negotiate for a reduction in warship tonnage.

It may seem irrelevant to recite the foregoing facts at a time when the entire resources of Japan have been mobilized in the service of national reconstruction and all other matters, including those of foreign and naval policy, are perforce in abeyance. But none who know Japanese virility and determination can believe for a moment that this disaster, terrible though it be, will permanently cripple the nation or discourage it from pursuing its traditional aims and policies.

As a leading member of the Japanese colony in London has just declared: "Japan is a sovereign state, committed to definite policies which have been merely interrupted, not canceled, by this catastrophe. The destruction of two great cities is not enough to cause a powerful and united nation to swerve aside from the path which destiny has appointed it to take."—Hector C. Bywater, *Baltimore Sun*, 5 October, 1923.

MR. KAWAKAMI ON BYWATER'S BONIN ISLANDS CHARGE.—TO THE EDITOR OF "THE SUN"—*Sir:* In *The Sun* for October 5, Mr. Hector Bywater replies to my article which also appeared in *The Sun* on September 4. Since Mr. Bywater accepts my figures as accurate, I stand upon my conclusions drawn therefrom, recognizing at the same time his right to his own conclusions. I may, however, take this opportunity to tell the public that I took considerable pains to be accurate in preparing that article, and had consulted both American and Japanese authorities, besides studying files of Japanese newspapers.

When Mr. Bywater's naval article was commented upon by publicists at Washington last spring, I, as Washington correspondent of the Osaka *Mainichi* and the Tokio *Nichi-nichi*, considered it necessary to cable something about it. So I interviewed Rear Admiral William V. Pratt, of the Naval General Board, showing him Mr. Bywater's article in the *Atlantic Monthly*. The admiral kindly gave me the following statement, which was cabled to the Osaka *Mainichi* on March 3 last in the usual "skeletonized" form:

"Japan has scrupulously observed agreements made at Washington. It is unfortunate that efforts have been made by certain writers to misinterpret Japanese intentions, and thus stir up ill feeling between Japan and America. I would further state that I deem it most inadvisable for writers of any nationality to publish articles which reflect even indirectly upon the motives or acts of those honorable men in both countries, who, to the best of their abilities, are endeavoring to live up not only to the terms of but to the spirit of the treaties entered into in Washington.

"I have always felt that the utmost honesty and fairness prevailed during the conference and has ever since. Your naval men and ours made great sacrifices, and swallowed much professional pride, but they did it for a purpose. That purpose was to show people that honest, fair-minded men could, in the interest of peace and good will, make great sacrifices to stabilize conditions which others with less foresight had brought to pass. Therefore, it is not to our interest as naval men to allow others to jeopardize a situation for which we have paid so much to secure.

"While in the past there may have been misunderstandings between certain peoples in your country and in mine, I would especially invite attention to the fact that nowhere in the history of the two nations can there be found between them the record for wars, mistrust, suspicion and agression that exists today, and has existed for many generations, between some of the states of Continental Europe."

The "skeletonized" form of the above statement had, of course, been submitted to Admiral Pratt before it was cabled to my papers in Japan. Later I prepared an extended article on the status of the Japanese Navy as affected by the Washington Treaty. Before publishing it in the *American Review of Reviews* I submitted it to Admiral Pratt for frank criticism.

Figures and facts contained therein were practically the same as those in the brief article which I recently published in *The Sun*. The admiral, having examined the paper, made this statement:

"Your article is a very fair presentation of the case from the Japanese point of view, and the general conclusions which you arrive at seem to me to be very sound. I made a note that technical data had better be checked by Nagano (Japanese naval attaché). Unfortunately, it is a fact that no matter what may be the intentions of a writer, a slight mistake may be used to create impressions entirely contrary to those he desires to make.

"Your explanation of the *status quo* case (concerning Pacific fortifications and naval bases) will do much to clear up what has been somewhat hazy in the minds of a good many Americans, and probably equally so in the minds of Japanese readers. I like your closing statement particularly well. It is so true that resources play such an important part in any modern war that this point should be carefully thought of by all peoples who, through a too jingo attitude, would involve their country in warlike operations which might be exceedingly disastrous to the good of humanity."

Concerning the fortification of the Bonin Islands, I repeat my statement that if Mr. Bywater will go to the islands and make personal investigations he will be convinced that there is not even the shadow of a fortification there. Mr. Bywater quotes from my own paper, the Osaka *Mainichi*, on this matter. But evidently his quotation is, not from the *Mainichi* itself, but from the Kobe *Chronicle* or the *Japan Advertiser*, which publish what is supposed to be translations of what appears in the Japanese press. With due respect to these American and British publications, I am compelled to admit that their translations are often very inaccurate. What the Osaka *Mainichi* originally said evidently was the "fortification of the Bonins, etc., when or if carried out, will be followed by a plan to build a port of call for warships at Miyakejima." For in the early spring of 1921 a Japanese naval committee recommended the fortification of the Bonins and a few other islands, but the recommendation was not acted upon.

It is quite officious for Mr. Bywater to say that I have, or Japan has, taken advantage of the sympathy created by the earthquake disaster to "make a sweeping repudiation of all recent charges concerning his country." My article in *The Sun* had been written a few weeks before the disaster, when I, not endowed with the sixth sense, had not known what Nature had in store for my native country.—K. K. KAWAKAMI.—*Baltimore Sun*, 14 October, 1923.

EARTHQUAKE "NOT A CATACLYSM."—A Japanese, long resident in this country, Mr. Adachi Kinnosuke, concludes at the end of a New York *World* article on the earthquake that this cataclysm is really "not a cataclysm at all." Rather—

"It's a price Japan has paid. And for two things:

"First of all, for a new, thorough-going friendly understanding with her neighbor Powers, more especially with the United States. For, after this destruction of the capital city, of the greatest seaport in the Empire, and of the naval base at Yokosuka, the oldest as well as the mightiest base the Japanese Navy has, no American jingo can accuse her of sitting up nights to hatch up a suicidal war with the United States—not for twenty-five years to come, anyway.

"And, secondly, for the new capital city and its seaport that are to rise out of the ashes of the old. Tokyo is to be born again. If one is reasonable and thinks it over, it is plain that nothing short of this tremendous destruction could have been enough for the birth pains of a wonder city to rise out of the ashes."

Neither of the points made by this Japanese writer have escaped news-

paper notice. To take his first thought first. While the actual loss to Japan's Navy may not be determined for some time, although the great naval base at Yokosuka is apparently destroyed, Japan's naval position is bound to be affected. For, writes Frederick William Wile in the Washington *Star*, "with the gigantic expenditure now become necessary for rebuilding devastated regions, it is impossible for Japan to bear the cost of resuming a costly naval program." And, we read, "a variety of contingencies is conjured up by such a prospect":

"The United States might find it unnecessary to spend all of the $110,000,000 which the Navy General Board recently recommended for new defenses in the Pacific. Great Britain, in the presence of a Japan materially weakened at sea, might pause in its program to make Singapore the Gilbraltar of the Far East. Even the Dutch East Indies on which the Netherlands Government is about to spend enormous sums for fortifications, in addition to new war craft, might no longer be considered subject to a 'Japanese danger.'"

While Japan will undoubtedly continue to dominate the Far East, "the attention of the Japanese Government will be fully occupied for years by domestic problems," writes Charles A. Merrill in the Boston *Globe*. Besides the closer commercial and financial relations with the United States bound to follow Japan's reconstruction orders in American markets, friendship between the two countries is likely to be strengthened, because:

"It will be a time when Japan will need and appreciate our friendship, and when enlightened self-interest will dictate that she follow the counsels of her liberals, who see in international co-operation the best security for Nippon, and avoid the policies of her Junkers and militarist class, who since the birth of the modern State have sought to rule Japan as an invisible Government behind the throne.

"Indeed, now, if ever, it would seem, must the militarists keep in the background."—*Literary Digest*, 22 September, 1923.

JAPANESE NAVY LOSS IN QUAKE NOT HEAVY.—Tokio, October 11.—Officials of the Navy Department state that although the Japanese Navy losses in the earthquake and fire were considerable, they think the naval power of Japan was not weakened as a result.

The warships *Amagi*, *Mikasa* and *Naka*, the latter a light cruiser under construction, sustained the most serious damage. The total damage to the three vessels is estimated at 11,000,000 yen ($5,500,000).

The construction of the *Naka* has been suspended.

The *Mikasa* will be repaired and used as a target ship. The *Amagi* will be replaced by another ship while it is being converted into an airplane carrier. The *Mikasa* was to have been destroyed, but has been saved by popular demand.

Naval institutions destroyed by the earthquake and fire include the naval technical laboratory, the hydrographic office, the Medical College and the powder magazine.

The Yokohama arsenal, while badly damaged will be repaired immediately.—*Washington Star*, 12 October, 1923.

UNITED STATES

AVIATION AND THE NAVY.—There seems to be a good deal of misunderstanding among the general public as to the attitude of the Navy toward aviation.

Starting off with the assumption that aircraft will put all ships out of business, as certain widely advertised individuals maintain, it is only natural that the man in the street should picture naval officers as fighting to hold on to their jobs and opposing every new development in the air.

I have been in the Navy thirty-five years and I have seen the battleship put out of business on paper many times. First there was the ram. Small steamers with huge rams were going to surround the battleship like so many hornets and sting it to death. Then came the torpedo boat, the destroyer and the submarine that were to sink it with a torpedo costing only a few thousand dollars; then the Zeppelin and now the airplane bomber, that are to shower destruction upon it from the sky. But the old battleship, like the old flag, is still there. Every new form of attack has developed a corresponding defense and the battleship still stands, the backbone of every country's naval defense.

Battleship protection against air attack will be of two kinds, defensive and offensive. The defensive consists in adding blisters or explosion chambers to the older ship's sides to protect the ship's vitals from bombs exploding near by in the water. New battleships have this protection built into the hull. Additional steel decks will be added to old battleships to prevent penetration of the bombs that drop on board. In addition, the battleship will be protected by high speed and constant change of course that will throw the bomber off his target, as will the barrage of bursting shrapnel from anti-aircraft guns. Moreover, the bomber will have to sustain the fire of dozens of machine guns before he can get within range. These may all be classed as defensive measures.

The fleet's offensive will be from fighting planes, launched by catapults from the deck of the battleship itself. These fighting planes will have as their mission to shoot down the slow, heavy bomber before he can get near enough to do any damage. That means that if the bomber is to get in his attack, he must be protected by an escort of fighting planes. But the air protection of the battleship when near an enemy coast will be supplemented by additional fighting planes other than those the battleship itself can carry. These will be provided by aircraft that accompany the battleships. The fleet's aircraft provided with means for flying off and landing on the carriers and backed up by the fire of the fleet, should make a most effective defense against land planes that would be fighting at sea, far removed from their bases, and certain of destruction if forced to alight. Under these conditions no successful bombing attack would be possible.

The Navy, far from opposing the development of aircraft, is anxious to develop its offensive and defensive powers to the maximum because it is realized that the airplane is one of the most powerful auxiliaries of the fleet. Airplanes and dirigibles too, in some cases, will make effective scouts, giving early information of the approach of the enemy and of the disposition of his fleet. They will be used for observing and directing the fall of our shots during battle and will attack, when possible, the enemy's vessels with bombs and torpedoes.

We are now building two aircraft carriers of 33,000 tons each. These were originally intended for battle cruisers, but under the Limitation of Arms Treaty they can be used only for aircraft carriers. The Navy is developing naval aviation to the limit of the funds that can be obtained from Congress. The public does not realize that the naval air force is regarded as just as much a part of the fleet as the submarine and destroyers. Squadrons of seaplanes formed a part of the fleet that went to Panama this year and took part in all the winter maneuvers of the fleet. Battleships and cruisers are all being equipped with planes and catapults to launch them. The *Langley*, our first carrier, has solved the problem of flying on and off a ship's deck at speeds up to sixty miles per hour. The Navy has just finished the *ZR-1*, the largest dirigible in the world and one of the greatest successes because it is filled with helium, a non-explosive gas, that makes it safe from explosion or burning. In addition, the *ZR-3*, built by Germany for this country, is preparing for its flight across the

Atlantic under control of the Navy. Navy planes hold the speed record of the world and new devices are constantly under test to develop the utmost in aviation. It would be a bold man that would care to say definitely how far the art of aviation will go, but only a fool would want to scrap what is best now for the sake of something that may be better ten years from now. Amateur strategists, with all the confidence born of ignorance, wish at once to scrap the Navy and the Army too, for that matter, and leave us nothing but aviation. They are the ones that are hurting aviation, because they are antagonizing the people who are most anxious to develop aviation and give it its proper place. History shows that new forms of warfare may add to, but never entirely abolish older forms. No one has ever invented a machine to take the place of a man. The World War was the most scientific war ever known. Chemicals, tanks, dirigibles and bombing planes did their utmost, but the battle was ultimately decided by men, men fighting hand to hand, with clubs and fists and knives, because a battle was never decided as long as the enemy held his positions—not until men got into the trenches and killed or captured the defenders and took possession of those positions themselves.

The aviator, unassisted, can never *hold* anything. He is essentially a raider. He sails over a town and drops his bombs and sails away. He might do that every day, as the Germans did over Paris. Protective measures are found and people get accustomed to it. Sieges have endured for months, with great guns pouring in a hell of fire day and night, and yet people—men, women and children—continue to live and get along in spite of it, just as the French did at Rheims.

Aviation is an additional means of making war—it is a powerful auxiliary, but after all, only an auxiliary. It must be supported and operate from bases. If its base is at sea, on aircraft carriers, there must be fleets to guard the carriers. If its base is on land, there must be armies with all the paraphernalia of war to hold these land bases. Aircraft need constant protection for their bases because they can fight only in pleasant weather and during daylight, and the enemy may want to fight all the time. We speak of defending the country with aircraft. No country ever won a war by sitting at home on the defensive. That is the Chinese Wall idea. The way to win wars is to go after the other fellow and hit him where he lives.

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There has been much misconception in regard to economy in using aircraft instead of battleships. In spite of an expenditure on aircraft of over one billion eight hundred million dollars since 1917, we have not today one-tenth of the aircraft we would need to enter war tomorrow. This is due to the short life of aircraft, the high cost of development and the frequency of crashes and operating casualties. Two-thirds of that cost would build a Navy bigger than our present one—a Navy that would be good for twenty years. So much for the economy argument.

The press has given much notice to the sinking of an obsolete battleship, abandoned, helpless and staked out like a lame bull in a pasture. This experiment is held by some cranks to prove that battleships are useless. The same conclusion would be just as logical if an obsolete airplane were hung up in the sky and shot down by battleships to prove that aviation is valueless. Or if the Army moved its troops out of one of the forts of New York and the Atlantic Fleet would knock the abandoned fort to pieces to prove that coast defenses are useless.

The Navy is going ahead developing its aviation to the limit of its appropriations, but it hasn't forgotten that it isn't the man that hits and runs away that wins the fight. We need a Navy that can stand up and take blows and hit back harder than the other fellow—a Navy with battleships *and* planes—and that is the kind of a Navy we propose to have.—Address

by Captain Luke McNamee, U. S. N., Director of Naval Intelligence, Washington, D. C., 21 September, 1923.

VESSELS UNDER CONSTRUCTION, UNITED STATES NAVY—Progress as of September 30, 1923

Type Number and Name	Contractor	Per cent of Completion				Contract date of Completion	Probable date of Completion
		October 1, 1923		September, 1 1923			
		Total	On Ship	Total	On Ship		
BATTLESHIP (BB)							
48 *West Virginia*	Newport News S.B. & D.D. Co.	97.3	96.9	95.3	94 8		12/1/23
AIRPLANE CARRIERS (CV)							
2 *Lexington*	Beth. S.B. Cpn. (Fore River)	40.1	31.6	39.2	30.5		Indefinite
3 *Saratoga*	New York. S.B Cpn.	33.4	30.4	32.9	30.		Indefinite
SCOUT CRUISERS (CL)							
6 *Cincinnati*	Todd D.D. & Const. Cpn.	99.1	98.1	98.8	97.8	7/1/22	1/ 2/24
7 *Raleigh*	Beth. S.B. Cpn. (Fore River)	95.2	91.	93.3	87.4	8/1/21	12/15/23
10 *Concord*	Wm. Cramp & Sons Co.	98.5	97.5	97.8	96.		11/15/23
11 *Trenton*	Wm. Cramp & Sons Co.	79.	71.	77.5	69.5	10/1/21	3/—/24
12 *Marblehead*	Wm. Cramp & Sons Co.	68.	60.	64.	56.	1/1/22	7/—/24
13 *Memphis*	Wm. Cramp & Sons Co.	55.	44.5	53.5	43.	4/1/22	11/—/24
AUXILIARIES							
Repair Ship No. 1	*Medusa* (AR1) Puget Sd. Nvy. Yd.	96.1	95.1	95.5	94.4		4/ 1/24
Dest. Tender No.3	*Dobbin* (AD3) Phila. Nvy. Yd.	82.5	82.1	81.5	81.3		6/30/24
Dest. Tender No.4	*Whitney* (AD4) Boston Yd.	79.3	77.6	76.9	74.9		Indefinite
Sub. Tender No. 3	*Holland* (AS3) Puget Sd. Nvy. Yd.	29.4	20.1	27.2	17.3		Indefinite
PATROL VESSELS							
Gunboat No. 22	*Tulsa* (PG22) Charleston Nvy. Yd.	99.5	98.9	98.7	97.9		11/10/23
SUBMARINES							
123 *S-18*	Elec. Boat Co. (Quincy)	98.6	98.6	98.6	98.6	7/ 1/22	12/—/23
126 *S-21*	Elec. Boat Co. (Quincy)	Comm.	9/14/23	99.1	99.1	10/30/22	
127 *S-22*	Elec. Boat Co. (Quincy)	98.6	98.6	98.6	98.6	10/30/22	1/—/24
128 *S-23*	Elec. Boat Co. (Quincy)	99.4	99.4	99.2	99.2	11/30/22	10/—/23
131 *S-26*	Elec. Boat Co. (Quincy)	99.5	99.5	99.1	99.1	12/30/22	10 — 23
132 *S-27*	Elec. Boat Co. (Quincy)	98.	98.	97.9	97.9	12/30/22	11/—/23
133 *S-28*	Elec. Boat Co. (Quincy)	98.2	98.2	98.	98.	12/30/22	11/—/23
134 *S-29*	Elec. Boat Co. (Quincy)	97.5	97.5	97.5	97.5	1/30/23	1/—/24
144 *S-39*	Elec. Boat Co. (San Fran.)	Comm.	9/14/23	99.3	99.3	11/19/22	
145 *S-40*	Elec. Boat Co. (San Fran.)	95.	93.6	94.	93.	12/29/22	11/ 1/23
146 *S-41*	Elec. Boat Co. (San Fran.)	92.	90.	90.3	88.7	12/29/22	1/ 1/24
153 *S-42*	Elec. Boat Co. (Quincy)	94.3	94.3	94.3	94.3	5/15/23	3/—/24
154 *S-43*	Elec. Boat Co. (Quincy)	94.6	94.6	94.6	94.6	6/15/23	2/—/24
155 *S-44*	Elec. Boat Co. (Quincy)	92.2	89.7	91.9	87.5	6/15/23	6/—/24
156 *S-45*	Elec. Boat Co. (Quincy)	94.6	94.6	94.2	94.2	7/15/23	4/—/24
157 *S-46*	Elec. Boat Co. (Quincy)	94.	93.5	93.2	91.7	7/15/23	5/—/24
158 *S-47*	Elec. Boat Co. (Quincy)	91.5	87.3	91.3	86.3	8/15/23	7/—/24
FLEET SUBMARINES							
163 *V-1* (SF4)	Portsmouth N.H. Nvy. Yd.ss	52.6	52.1	50.3	49.9		Indefinite
164 *V-2* (SF5)	Portsmouth N.H. Nvy. Yd.ss	45.1	.....	43.3	.....	.....	Indefinite
165 *V-3* (SF6)	Portsmouth N.H. Nvy. Yd.ss	41.6	.....	39.3	.....	.....	Indefinite

Authorized but not under construction or contract.
Destroyers—(12) Nos. 348 to 359 inclusive.
Transport—(1) No. 2.
Fleet Submarines—(6) Nos. 166-171.
Neff Submarine (1) No. 108.

MANEUVERS OF 1924 ABOUT THE CANAL AND IN THE CARIBBEAN SEA.—Washington, October 4—Army, Navy and Marine Corps will act together in January, 1924, for the first time in working out a war game if the program tentatively approved by the Navy Department for the spring maneuvers of the battle fleet is executed.

Operating from the Island of Culebra, in the Caribbean, the most complete naval force organized under the American flag since the World War will defend the eastern approaches of the Panama Canal. Prior to the final phase off the Canal, however, the combined fleets will have carried out over a period of ten to twelve weeks, the various stages of a "problem" drawn up by the joint Army and Navy board after survey of the position of the United States in relation to its potential enemies.

A marine expeditionary force, fully equipped, will be rushed to Culebra on transports to take part in the land maneuvers, and the Army will be given an opportunity to try out the improved defenses of Panama. Aviation arms of both services are to be represented in unprecedented force, the *ZR-1* being included in the air contingent scheduled to participate.

The attacking forces will make a preliminary cruise of several thousand miles in order that their condition will be approximately that of the enemy.

GREATEST SINCE WAR

Details of a plan of operation for 1924 comprising what was described as "the greatest scope of activity by the American Navy since the World War," were revealed aboard the flagship *Seattle* by Admiral Robert F. Coontz, commander-in-chief of the United States fleet now at Los Angeles harbor.

The plan centers around a Caribbean cruise on which more than fifteen warships of the combined fleets based on Vasquez Sound, Porto Rico, will be engaged for more than three months in a comprehensive program of strategical problems.

The United States battle fleet in command of Admiral Samuel S. Robison will leave Los Angeles Harbor January 4, next, for the first rendezvous at Panama. It will be accompanied by the fleet base force under Rear Admiral John V. Chase, both forces reaching Balboa, January 16, after carrying out two battle programs on the way.

Destroyers, submarines and aircraft will accompany the fleet on the 3,000-mile voyage to the Panama Canal, operating directly with the dreadnaughts.

The scouting fleet operating in the Atlantic, in command of Vice Admiral Newton A. McCully, will leave Hampton Roads for the Canal, January 4. The East coast dreadnaughts, destroyers and submarines will be accompanied by the control force under Rear Admiral Montgomery M. Taylor. This fleet is due to reach Colon, January 14.

The first big maneuver of the cruise will be staged at Panama. The scouting fleet and control force, assembled at the eastern entrance to the Canal will defend it against the "onslaught" of the great armada of dreadnaughts, aircraft, destroyers and submarines sweeping in from the Panama Canal.—*Boston Transcript*, 4 October, 1923.

TWO MINESWEEPERS AT HAWAII PUT IN COMMISSION.—Two minesweepers at Hawaii, the *Pigeon* and *Penguin*, have been placed in commission. They will go to Shanghai for duty with the Yangtze Patrol.

SEVENTY PLANES AT WINTER MANEUVERS THIS YEAR.—The information is that about seventy planes will go South with the fleet next winter.—*Operations Conference News.*

CRUISER "MARBLEHEAD" LAUNCHED October 9.—The U. S. light cruiser *Marblehead*, whose normal displacement is 7,500 tons, with an over-all length of 555 feet six inches, was launched at Cramps ship yards, Philadelphia, Pa., October 9, 1923. The ship was christened by Mrs. Hannah M. Evans of Marblehead, the first gold star mother of that city.

The *Marblehead*, like her nine sister ships, is designed for a speed of 33.7 knots and will be equipped with Westinghouse Parsons turbines capable of developing 90,000 shaft horsepower and will be driven by four screws. The keel of the *Marblehead* with laid August 4, 1920. The main battery consists of twelve six-inch guns installed in one two-gun turret forward, one two-gun turret aft, eight guns in single mounts on two levels. She is also equipped with four 3-inch anti-aircraft guns and torpedo mounts. She is to be fitted out as a flagship for a division.

The high speed light cruisers less than ten years old that are built and building for the three great naval powers give them the following standing:

British Empire	48	252,990 tons
Japan	25	157,730 tons
United States	10	75,000 tons

This shows that the United States is seriously deficient in this class of ships, and the eight new cruisers which will be asked of Congress by the Navy Department this coming session constitute the minimum number deemed compatible with security.—*Army and Navy Journal*, 13 October, 1923.

NAVY MAY REPAIR TRADES SHIPS.—A proposal that all repair and maintenance work upon government shipping be turned over to the navy yards was discussed at a conference of representatives of the government departments which operate or control water-borne transports. The object, it was said, would be to keep the navy yards at a high state of efficiency without attending high costs.

One suggestion put before the meeting was that the Navy be given a revolving fund equal to the aggregate annual appropriation of the several departments for maintaining their ships. Steps will be taken to work out a detailed plan in order that it may be presented to Congress for necessary financing.—*Boston Transcript*, 6 October, 1923.

MERCHANT MARINE

ENFORCEMENT OF JONES BILL ADVOCATED.—In articles appearing in the September 8 and 22 issues of *The Nautical Gazette* it was pointed out that if our merchant marine is to be maintained as a competitive factor among the mercantile fleets of the world it is necessary that our rapidly obsoleting government ships in foreign trade be replaced by new tonnage. The high cost of ship construction in this country as compared with that prevailing abroad thrusts upon American vessels a severe operating handicap which would deprive even the most modern and efficient American built ship of its effectiveness as a competitor for the world's trade. In other words, we are placed in the anomalous situation whereby we need new tonnage to compete on foreign trade routes, but if it is built in this country it ceases to become competitive, and yet it would be a poor policy to purchase foreign-built ships to the obvious detriment of our own shipbuilding industry.

This is one of the most complicated problems that shipping men are facing today, and there is a growing sentiment in favor of solving it by giving indirect aids to American ships. Discussing the question with a representative of *The Nautical Gazette*, Mr. F. P. Palen, vice-president of the Newport News Shipbuilding and Dry Dock Company, said that the appli-

cation of indirect aids such as are provided for in the Jones Bill will do more than anything else to meet the needs. "The imposition of preferential duties on goods shipped in American bottoms will divert a large amount of trade to American vessels," he said, "and so long as they are able to get the business American ships will be able to operate and set up an effective competition against foreign vessels despite their higher construction costs. Under this form of protection American shipowners would be able to secure a higher freight rate than that charged by foreign lines and still land cargoes in this country cheaper than a foreign ship could. This higher freight rate would do much to offset the capital cost differential and place American vessels on a more equal footing with their foreign competitors.

"The main objection to this measure has been a fear of retaliation by foreign countries, but this is a mere bugaboo by which we ought not allow ourselves to become intimidated. In order to retaliate a foreign country must itself be under a high tariff policy, but our greatest competitors on the sea are not surrounded by a tariff wall for they cannot live under protection, therefore we have little to fear from this direction. Furthermore, to make the retaliation at all effective not only must our maritime competitors themselves be protected nations, but other countries with which we do business must be under similar tariffs, and it is not probable that all these countries will enforce a tariff policy for the sake of retaliating against American shipping. The greatest fear of retaliation comes from Britain, but it must be borne in mind that only a comparatively small proportion of our trade is with that country, and if Britain should see fit to discriminate in some way against American vessels, it would have only a negligible effect upon our foreign trade as a whole. If, however, other countries should see fit to unite in a form of retaliation against American ships, but it is not likely that they would, then we as a nation ought not to be cowed by it, but rather prove, as we have done in the past, that we are able to overcome it."

Mr. Palen also said that another important form of aid to American shipping would be the extension of the coastwise laws to the Philippines. "Such an action would take up much of our idle tonnage," he declared, "with the result that the congestion on the foreign trade routes would be relieved. There is no reason why an excellent business could not be built up for American vessels between the United States and the Philippines, and profitable employment found for a large number of our ships. For fifteen years before the war we built up a flourishing business with the Hawaiian Islands and during that period much of the best tonnage turned out in American shipyards was built for this trade. If the Philippines were brought under our coastwise laws history would repeat itself and there would naturally arise a demand for American ships for this trade where under the protection from foreign competition the higher capital cost would not loom as so important a factor as in the foreign services."

The clause in the Jones Bill providing that a rebate on the tax on profits of American steamship companies shall be allowed on condition that such rebate shall apply on the cost of new vessels built in American yards was also favored by Mr. Palen. "This provision is of inestimable benefit not only to our shipbuilding industry but also to our steamship owners," he said. "The profits of the shipping concerns at the present time are exceedingly light and the clause is thereby robbed of much of its value, but with the imposition of the preferential duties it would assume added significance. Under this form of indirect aid the profits would increase and the rebates would automatically become correspondingly larger. Therefore, since a shipowner would have to spend the money in any case, either in taxes or new construction in American yards, it is obviously to his

greater advantage to put it into new tonnage. Several of the new vessels built recently have been ordered under the benefits of this clause, but it is so interlocked with the other provisions of the Jones Bill that it does not convey its intended advantages until the other clauses are enforced."

In conclusion Mr. Palen said that every American industry that is in international competition is afforded protection with the exception of the shipping industry, and there is no reason why it should not be given the protection of the indirect aids as outlined in the Jones Bill. The law has never been tried, but it is becoming more and more apparent that some such assistance must be given American ships if they are going to succeed in foreign trade, therefore, it would be a natural expedient to put into effect the law that is already on our statute books, and give it a fair trial before throwing it into the discard.—*The Nautical Gazette*, 6 October, 1923.

Diesel Electric Barge "Twin Ports" Makes Maiden Trip.—Maneuvering with the utmost ease and handling herself like an old and tried vessel, the Diesel electrically propelled Great Lakes and Canal barge *Twin Ports*, of the Minnesota Atlantic Transit Company, completed her maiden voyage between Ashtabula and New York on September 20. She carried a bulk cargo of rye and was accompanied through the Erie Canal by a party of engineers and shipping men. The trip through the Welland Canal, down the Erie Canal and through the Hudson waterway was made without a hitch.

The *Twin Ports* is driven by twin propellers operated by 250 h.p. direct current motors taking current from two 250 k.w. generators. These are operated directly by two Lombard Diesel engines, the power plant being sufficient to drive the ship at a maximum speed of thirteen miles per hour in deep water. Complete electric auxiliaries, including steering gear, ventilation, capstans, winches, refrigeration and heating are operated from the main power units. When these are shut down in port or while going through the locks, an auxiliary 40 k.w. generator furnishes the necessary power.

The *Twin Ports* is the first of two vessels, the second of which will be known as the *Twin Cities*. She was built by the Great Lakes Engineering Works at Ashtabula and designed by Henry Penton, naval architect of Cleveland. The electrical propulsion machinery was made by the General Electric Company.

The *Twin Ports* has a total cargo capacity of 2,600 tons, divided into 600 tons of refrigerator and 2,000 tons of bulk cargo. The vessel is 258 feet long and forty-two feet wide, and the first boat built expressly for Erie Canal and coastwise service. She is the forerunner of a large fleet of vessels which, it is expected, will operate through the New York State Canal system, carrying products of the Middle West from Duluth to the Atlantic seaboard. In the winter months the *Twin Ports* is scheduled to operate in N. S. coastal service between New York, Southern ports and the West Indies, carrying refrigerator and other perishable cargoes.—*The Nautical Gazette*, 29 September, 1923.

World's Largest Diesel Engines.—London, September 8.—Authentic details are forthcoming in Belfast of a remarkable advance in marine engineering. Harland and Wolff have started building Diesel oil engines for the two first-class passenger motor-driven liners ordered recently by the Royal Mail Steam Packet Company, for their South American trade, which will develop 13,000 horsepower. They will mark an enormous advance on the present most powerful engine of the same type which is only 3,000 horsepower.

The two vessels when launched will be the largest motor-driven vessels afloat. [*Albany Journal*]—*Boston Transcript*, 22 September, 1923.

AMERICA DROPS TO SIXTH PLACE IN SHIP BUILDING.—London, October 10.—Not only Great Britain and Germany, but Italy, France and Holland, as well, are building more tonnage than the United States today, says a statement just issued by Lloyd's Register of Shipping, giving returns for the quarter ended September 30. In the past four years, it is pointed out, this country has fallen from first to sixth place among the shipbuilding nations of the world.

World construction at the close of the quarter just ended was smaller than at any time since the close of the war, Lloyd's Register states, and this represents a decline of more than 165,000 gross tons in comparison with the preceding quarter, ending June 30, last. In the past three months the aggregate of American construction decreased 34,000 tons, that for Great Britain and Ireland, 66,000 tons, and for all other countries combined, 65,000 tons.

The following table shows in gross tons the comparison of construction orders now as compared with three months ago:

	October 1	July 1
Great Britain and Ireland	1,271,195	1,337,759
United States	99,383	133,660
Other countries	1,007,119	1,072,437
World total	2,377,697	2,543,856

If only construction on which work is actually proceeding is taken into consideration, however, Lloyd's Register points out, the present aggregate is 229,000 tons less than three months ago. Contracts on which work has been suspended in Great Britain and Ireland now represent 242,000 tons, as against 83,000 tons for all other countries. The actual construction now under way, therefore, compares with that of the previous quarter as follows, the figures representing gross tons:

	October 1	July 1
Great Britain and Ireland	1,029,195	1,207,759
Other countries	1,023,502	1,074,097
World total	2,052,697	2,281,856

It will be seen, therefore, says Lloyd's Register, that while the actual work in British shipyards has decreased more than 175,000 tons since July 1, that in all other countries taken together has fallen off only 50,000 tons. As a result, British plants, which three months ago were constructing 133,000 tons more than all the rest of the world combined, are now building only about 5,000 tons more.

Returns from all countries of the construction work being done under the supervision of Lloyd's Register, and intended to be classed with that society, show a total of 1,268,571 gross tons, of which 976,446 tons represent orders in Great Britain and Ireland. Thus more than half of all the seagoing merchant tonnage building throughout the world is being classed by Lloyd's and more than three-fourths of the British total.

That new work commenced is not keeping up with the volume of shipping being pushed toward completion is indicated by the returns, which show that during the past quarter the world launchings represented 81,000 gross tons more than the total commenced. There is also shown a decrease of more than 100,000 gross tons in the volume of new work as compared with that in the previous quarter, as indicated in the following table, the figures shown representing gross tons:

	October 1	July 1
Great Britain and Ireland	92,079	288,121
Other countries	100,772	75,737
World total	*212,232	314,375

*Germany excluded: figures not available.

In comparison with the decline of 127,000 tons in the work commenced in British yards, it will be noted that other countries showed an increase of 25,000 tons, even with the new German construction excluded.

The comparisons of launchings for the two periods also show sharp decreases during the past three months. For British yards Lloyd's figures show a decline of 175,000 tons, as against 101,000 tons for the rest of the world, as indicated by the following table, in gross tons:

	October 1	July 1
Great Britain and Ireland	62,979	239,121
Other countries	231,044	332,291
World total	294,023	570,412

Tanker construction, which had been decreasing steadily for a long period, showed practically no falling off during the last quarter, the small decline in the British total tonnage being almost offset by the increase for foreign countries, while there was no change in the figures for the United States, as the following table shows:

	October 1	July 1
Great Britain and Ireland	92,796	102,836
United States	19,800	19,800
Other countries	65,994	57,144
World total	178,590	179,780

There were several changes in the construction ranking of the various shipbuilding countries during the quarter just ended, says Lloyd's Register. British and German yards still lead, but France, which was third three months ago, has changed places with Italy, and is now fourth. Holland has taken the position of the United States, which was then fifth, and is now sixth; while Japan and the British Dominions continue to rank seventh and eighth, respectively. Holland, Italy and Japan are the only ones to show increases in the volume of work in hand, and these are slight.

Almost without exception the various countries are building less tonnage now than before the war. Italy has more than doubled its pre-war figure, and the British Dominions show a very small increase, all the others named above registering declines, as the following table, for the quarter just ended and the last quarter before the war, shows, in gross tons:

	October 1, '23	June 30, '14
Great Britain and Ireland	1,271,195	1,722,000
Germany (with Danzig)	345,985	547,000
Italy	145,423	69,000
France	142,660	227,000
Holland	104,491	116,000
United States	99,383	148,000
Japan	78,012	92,000
British Dominions	38,445	37,000

Britain and Germany, it will be noted, have regained their pre-war ranking, but the United States has fallen from fourth to sixth place, its old rank now being held by France.

The total world tonnage under construction just before the outbreak of the war, Lloyd's Register points out, was 3,162,890 gross tons, the present aggregate representing a decline of about 800,000 tons.—*Boston Transcript*, 10 October, 1923.

AERONAUTICS

"ZR-1" MAKES SUCCESSFUL 2,200 MILE FLIGHT.—A most impressive demonstration of the worth of the U. S. naval airship *ZR-1* was given a large section of the country on October 1-3, when the big rigid successfully accomplished a 2,200-mile cross-country flight from the naval air station at Lakehurst, N. J., to St. Louis and return. The total elapsed time of this great flight, which ranks with the most important accomplishments in long distance airship navigation, was forty-seven hours, forty-nine minutes; actual time in the air forty-five hours, eleven minutes; actual flying time, including a four-hour cruise over St. Louis forty-two hours, eleven minutes; average speed fifty-two miles per hour; highest speed seventy-eight miles per hour; total distance approximately 2,200 miles. On the return trip the ship consumed 654 gallons of gasoline.

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Carrying a crew of forty-two, the *ZR-1* left Lakehurst at 6:59 A. M., October 1. She soon ran into a thirty-five mile headwind which remained with her most of the first day out. At first the ship was flown at 1,500 feet altitude in order to cross the Pennsylvania mountains. The headwinds cut down the ship's speed considerably on the outward journey. When she passed Mount Holly, N. J., her ground "speed" was only 17 knots, although her air speed was 41 knots.

The unfavorable weather continued as the *ZR-1* flew over Philadelphia, Reading and Harrisburg, Pa. At 12:45 P. M., thirteen miles beyond Harrisburg, which she had passed an hour before, the strength of the wind decreased to some extent, but the air continued "bumpy" and it was not until the vicinity of Pittsburg was reached that the ship's ground progress exceeded her air speed.

Zanesville and Springfield, Ohio, were put behind and the ship passed over Dayton, Ohio, at 7:48 P. M., central standard time, searchlights from McCook Field playing on her silver sides as she went by. After flying over Cincinnati an hour and a half later, the dirigible traversed a section of Kentucky, including Independence, near Louisville.

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Weather conditions had become favorable so that when the ship reached Evansville, Ind., at midnight, she was flying smoothly, making about 40 knots with her motors going at only half speed. Carmi, Ill., was put behind her an hour later, and over Illinois the ship's speed became so much faster than had been calculated that a radio dispatch was sent to Captain Frank McCrary, commander, by Admiral Moffett to reduce speed to avoid arriving in St. Louis too early.

The big ship hove in sight of St. Louis at 3:30 A. M., October 2, but the weather was pretty misty just then and the *ZR-1* cruised around until she landed at St. Louis Airport at 7:45 A. M. A ground crew composed of the St. Louis naval air detachment and of Army airship men whom Major John A. Paegelow, A. S., commanding officer of Scott Field dispatched to St. Louis for that purpose, lent hand in handling the ship on the ground and acquitted themselves of their job very creditably.

The big ship effected its landing with a series of circles which gradually brought her nearer to earth. The first two circles were made at a height estimated at 400 to 500 feet.

On the next of the leisurely and elliptical circles, the ship's nose was definitely pointed toward the ground. Anchors were dropped, for use of the ground force when the ropes should be lowered. It seemed that the descent would be made then, but another trip to the southeast, at low altitude, was made. Then ropes were dropped from the hold, and cables, with pulleys, were lowered from the forward cabin. Another set of lines was dropped from the rear.

One hundred and twenty enlisted men of the Army and Navy caught the spider web of ropes. While the holders of two long cables, running on pulleys, drew her nose slowly earthward, the more numerous holders of many lines, branching from ropes let down from a hold on the interior of the ship, spread themselves over the surrounding ground and stabilized the position of the great craft, just over the heads of the soldiers and assembled civilians.

The work of pulling the ship down came chiefly upon the holders of the forward lines, and after a moment of earnest tugging, the ship settled down over the black earth.

About 9:30, after official goodbyes, the officers returned to the cabin and the easing of the ropes began. At 9:40 the *ZR-1* took the air and sailed first to the West, then, on a higher altitude, due East toward the city.

After skirting the northwestern portion of the city and laying its course parallel with the Mississippi River, the big ship turned southward after eastward and followed the downtown district.

Four airplanes which convoyed the giant dirigible looked ridiculously small in comparison with the leviathan of the air.

After crossing the Mississippi it cruised about for a time at low speed and made one complete turn before resuming its journey. The airplane convoy accompanied it across the river and then returned to St. Louis Field.

The return trip, aided by favorable winds was made at a much better rate of speed than the outward journey. The ship landed at home station, Lakehurst, at 6:08 A. M., October 3.—*Aviation*, 15 October, 1923.

OVER LAND AND SEA FOR A 4,500-MILE RECORD.—The latest world-record dirigible flight would have taken the flyers from Toulon, France, to St. Louis, Missouri, in four and a half days. This comparison of time and distance sums up one aspect of the great cruise of the German-French dirigible, *Dixmude*, which lately smashed all world air records for distance by traveling some 4,500 miles, without landing, in 118 hours. The flight of our own American built Zeppelin, the *ZR-1*, from Lakehurst to St. Louis, at about the time when the French record was announced, created some stir in this country, but it does not compare with the astonishing record set by the Frenchmen in their German-built ship. The only other air cruise comparable to it is that which was made by a German ship during the war. The Zeppelin traveled from Bulgaria, in unbroken flight over North Africa, and back again, a distance of some 4,000 miles. This ship, in common with the French-manned flyer which has just established a world record, was inflated with hydrogen gas. The hydrogen gives an advantage in lifting power of about ten per cent over the helium gas with which our own big rigid is filled, but the advantage is offset by the continual danger from fire in a hydrogen-filled ship.

A cable dispatch from Marseilles briefly describes the route of the record-breaking flight as follows:

Leaving Cuers-Pierrefeu Tuesday morning at 7:55 o'clock, the giant dirigible made straight course across the Mediterranean, flying over Algeria and Tunisia to the outskirts of the Sahara Desert on Wednesday. Starting back home Thursday and meeting with a hurricane over Sardinia, the airship was compelled to turn back to Africa.

On Friday the *Dixmude* started across the Mediterranean northward, flying over Sicily and Corsica. Sighting Toulon, it then shifted its course northwestward to Bordeaux, and then, steering a northeasterly course, flew over Paris Saturday morning at 7 o'clock.

Heading southward once more, the *Dixmude* passed over Moulins, where it dropped a wreath on the monument to the aviators killed when the dirigible *Republique* collapsed and crashed there some years ago. The

airship was over Nice and Monte Carlo at 11:30 o'clock last night. Skirting the Mediterranean during the night, it landed at its starting-point this morning at daybreak.

THE BIG AIR-LOOP OF THE DIXMUDE

This record bears witness, in the double turn in the lower right-hand corner, to the uncertainties of air-cruising. The ship was on its way back to France, when a tempest forced it to return to Africa. This accident, it appears, contributed several miles to its record.

The ship which made the record was formerly the Zeppelin *L-72*, and the French crew has had some difficulty in learning to handle it, we gather from an article on the airship in a recent number of *L'Illustration* of Paris. The *Dixmude*, as it is now called, has been "in training" in its French home for the past three years.—*The Literary Digest*, 20 October, 1923.

WORLD'S LARGEST AIRSHIP NEARING COMPLETION FOR THE U. S. GOVERNMENT IN GERMANY.—The United States Navy Department is the Government Department charged with the development of rigid airships. The Navy Department accordingly entered into negotiations with the German

Government and the Zeppelin Company to construct a commercial type airship of approximately 70,000 cubic meters capacity, and upon its completion to deliver it by a German crew to the U. S. Naval Air Station, Lakehurst, N. J. The airship is to include the very latest knowledge of the Zeppelin Company, particularly as regards provisions for adequate strength and safety.

The size of this airship is the same as the latest airship built by the Zeppelin Company at the end of the war, namely, a gas capacity of 70,000 cubic meters. The *ZR-3* has, however, been designed specially to accommodate passengers, and special attention has been directed to all factors involving convenience, strength and safety.

The general dimensions of the ship are as follows:

Overall length	200	meters
Maximum diameter	27.64	meters
Maximum width (propellers horizontal)	27.64	meters
Maximum height (including landing buffers)	31.00	meters

Mere figures, however, do not give an adequate conception of the tremendous size of this great aerial liner. Nothing like the *ZR-3* has ever been launched. A better idea of the ship's dimensions may be obtained by considering the size of the hangar at Lakehurst which will eventually house this "Queen of the Air." This hangar is the largest in the world and is of such enormous size that the National Capitol building could be placed inside except for a small portion of the dome. The Union Railway Station at Washington could be placed inside this structure without touching in any place. The Woolworth Building if placed on its side could be placed inside the hangar with plenty of room to spare. It is such a building that will house the *ZR-3* upon her arrival in the United States.

To drive this ship through the air at a speed of eighty miles an hour, 2,000 horsepower is required. This is obtained from five Maybach engines of 400 horsepower each. Each engine is contained in a separate power car. These power cars are distributed along the under side of the ship, and supported to the airship's framework by means of wire cables and struts.

These engines, which have been designed by the well-known firm, the Maybach Motor Company of Friedrichshafen, Germany, which is affiliated with the Zeppelin Company, are quite revolutionary and will contain many new features. They have been especially designed for great endurance and long life which is essential for commercial airships which will make long flights over the sea. They are of V form and have twelve cylinders. One of the new features is its reversibility, the engine itself being reversible, thus doing away with the weight of reversing gears. All five engines may be reversed at the same time, so that the ship's forward progress can be halted very quickly. The reversibility feature was introduced in the engines designed for the U. S. Navy Submarine Chasers during the World War. However, this is the first time this feature has ever been incorporated in an aviation engine.

This airship will have incorporated in it many refinements of design, the results of almost twenty-five years continuous efforts on the part of the Zeppelin Company. The equipment and accommodations for passengers will be as complete and as comfortable as the Zeppelin Company is capable of designing, with all their years of experience behind them.

To get an idea of the luxurious appointments and officer's staterooms on the *ZR-3*, which will have space for thirty passengers, one has only to recall the equipment on the large ocean liners. The seating and sleeping arrangements compare favorably with the finest American Pullman cars. These quarters are arranged in the main cabin, which is rigidly secured to the keel under the forward end of the ship. The passenger cabin is also fitted with a modern kitchen equipped with electrical stoves.

The guest room is divided into five compartments, each compartment seating five persons comfortably. The windows are large so as to give the passengers an excellent view of the world beneath. Travel under these conditions will be as luxurious as modern science can make it. The passengers will have none of the discomforts of trainsickness or seasickness. The motion in a airship of this size is unappreciable, and there are no other discomforts to detract from the pleasures of the journey. Recall wartime transportation accommodation for enlisted men and you can picture the crew of the *ZR-3*, in all about twenty-four men, their belongings and themselves stowed away neatly in bunks inside, along the corridor running all the way along the belly of the ship. Quarters are geographically located so that the mechanics and others will at all times be near the scene of their duties.

The *ZR-3* has been fitted with bow mooring equipment so that she may be secured to a mooring mast. Opinion in the United States is that the mooring mast will prove to be the door which will open up tremendously the commercial uses of rigid airships.

The trans-Atlantic flight will probably follow during the winter months (November). The stretch from Friedrichshafen to the East Coast of the United States in a straight line is 3,500 nautical miles, while the British *R-34* on its American flight from Scotland to New York covered an average distance of only 2,800 nautical miles. . . . The direct route will probably not be flown but preference will be given to a more southerly course, where less violent headwinds are to be expected. As it is known that the average west winds in the vicinity of the thirtieth degree of latitude are considerably less, the planned route is therefore, leaving Friedrichshafen across southern France, passing Cape Finistere and the Azores Islands to the south of the Bermudas and northward again to the place of destination. This route, however, is much longer, it measures about 4,500 nautical miles, that is, nearly one-third more than the direct route over the English Channel, Ireland, Newfoundland and Nova Scotia. On account of the longer flight route nothing like a new crossing record must be expected. It is estimated, however, that *ZR-3* will make the passage in seventy-five to 100 hours, that is, in between three and four days.

In the above article, mention is made of the use of hydrogen for the inflation of the *ZR-3*. This is apparently in contradiction to the policy of the U. S. Navy to use helium for airships. However, it is explained by the fact that the *ZR-3* will be flown to this country under the direction and at the responsibility of the Zeppelin Company and will not be come the property of the United States Government until delivery is effected at the Naval Air Station, Lakehurst, N. J.—Navy Department News Bulletin.

Delay in Completion of "ZR-3."—Owing to technical difficulties encountered in the perfection of the new Maybach engines and other natural difficulties of a non-technical nature the Zeppelin Company does not expect to complete the *ZR-3* before the early part of 1924. Due to the above arrangements and on account of the unfavorable weather conditions often encountered in Germany in winter, the Zeppelin Company has decided to postpone the trial of this airship until the early part of the spring of 1924. —Bureau of Aeronautics.

The United States Wins the Schneider Cup Race.—Lieutenant David Rittenhouse of the United States Navy, piloting a Curtiss-Navy *CR-3* seaplane at a speed of 177.38 mi./hr., won on September 28 the Schneider Cup from its English holder against a field which had been reduced to another American, an Englishman and a Frenchman.

Lieutenant Rittenhouse crossed the finish line of the 186 nautical mile course in 1 hr. 12 min. 26 4/5 sec. Lieutenant Rutledge Irvine, piloting

another Curtiss-Navy *CR-3,* finished second, with a speed of 173 mi./hr., less than two minutes behind Rittenhouse, and the Englishman, Captain H. C. Biard, piloting a Supermarine with Napier-Lion engine, finished third, nine minutes behind the winner. The Frenchman was eliminated when forced to alight on the water, and his plane was towed ashore undamaged. The race required five circuits of a triangular course each circuit equivalent to forty-two land miles.

Captain Biard had been disqualified because he rose from the water before crossing the starting line, instead of taxiing over it, but as the plane touched the water after crossing the line the judges withdrew their disqualification ruling. Engine trouble developing at the last mnute kept two of the French entrants from flying. Accidents during trials had already accounted for one of the American and one of the English entrants.

Lieutenant Rittenhouse's speed is a record for the event, beating by 31 mi./hr. the record established at Naples last year by Captain Biard.

Huge crowds, which included many of the highest of the British Navy officials, gathered to see the race, and Cowes was filled with American and French visitors. The U. S. S. *Pittsburgh* was anchored off Cowes and two French ships were stationed in the Solent.

* * * * * * *

During the seaworthiness tests held the day before the race, R. W. Kenworthy, pilot of the British entry Napier "Pellett" had a narrow escape when his plane capsized and sank in deep water. The plane had just crossed the starting line and was taxiing when it suddenly began to dip by the head. It plunged forward twice and then sank. Kenworthy was thrown to the bottom of the cockpit and did not emerge for thirty seconds. He was immediately picked up by Lord Montagu of Beaulieu in a motor boat and recovered promptly when artificial respiration was applied.

Large crowds watched the qualifying tests. Each machine was required to taxi over the starting line and ascend, taxi over two half-mile stretches at a minimum speed of 12 knots and then taxi across the finish line and lie moored for six hours unattended.

* * * * * * *

America was represented in the Schneider Cup Race this year for the first time. The team consisted of four Navy Pilots, Lieutenant David Rittenhouse, who piloted the winning Navy-Curtiss *CR-3* seaplane; Lieutenant Rutledge Irvine, who secured second place in a sister ship of the winner; Lieutenant F. W. Wead, whose seaplane, the Navy-Wright *NW-2,* was eliminated by an accident in the trials, and Lieutenant A. W. Gorton, who won the Curtiss-Marine Trophy last year with a Navy *TR-1* seaplane of similar type to the *TR3A* entered in the Schneider Cup race. Press despatches stated that one of the American entries had engine trouble before the start and was unable to compete. While neither the plane nor pilot were identified, the machine referred to was probably the Navy *TR3A,* as the Navy-Wright machine had met with an accident four days before the race.—*Aviation,* 8 October, 1923.

Navy Pilot Wins Pulitzer Race.—Lieutenant (jg) A. J. Williams, U. S. Navy, won first place in the Pulitzer race at St. Louis on October 6, averaging 243.67 miles an hour on the triangular course. Lieutenant H. J. Brow, U. S. Navy, was second, covering the 200-kilometer distance at the rate of 241.78 miles an hour. Lieutenant L. H. Sanderson, U. S. Marine Corps, was third with 230.06 M. P. H., and Lieutenant S. W. Callaway, U. S. Navy, fourth at 230 M. P. H.

This performance by Lieutenant Williams betters the former world's record for 100 and 200 kilometers, made in the Pulitzer race last year by over thirty-seven miles an hour. It is interesting to note that all of the

contestants in the Pulitzer race this year who finished made speeds well over last year's record.

Both first and second places were won by Navy Curtiss racers powered with Curtiss D-12 engines of 500 H. P. Third and fourth places were won by Navy Wright fighters, with the Wright T-2 engines of 700 H. P. Fifth and sixth places were won by Army Curtiss racers with Curtiss D-12 engines, in the same planes that won the Pulitzer race last year at Detroit.

The winning of the Pulitzer race and trophy by the Navy pilots brings to a conclusion the St. Louis air meet, in which the Navy was represented in three races. The Liberty engine builders' trophy race on October 4 was won by an Army air service pilot in a Fokker *CO-4* plane. The Merchants' Exchange of St. Louis trophy race on October 5 was won by an Army air service pilot in a Martin bomber.—*Army and Navy Register*, 13 October, 1923.

"ZR-1" IS RENAMED AS SHIP OF THE LINE.—Lakehurst, N. J., October 10.—With all the pomp and ceremony attendant upon the launching of a new battle cruiser, the *ZR-1*, first dirigible of the rigid Zeppelin type to be built in America, was renamed the *Shenandoah* this afternoon at the Naval Air Station near Lakehurst and officially received into the United States Navy as a ship of the line. Mrs. Edwin Denby, wife of the Secretary of the Navy, was sponsor. Following the exercises, both Secretary Denby and his wife went for a short cruise in the airship.

The lines were cast off and the *Shenandoah*, heading north, rose gradually to an altitude of about 2,000 feet. She then came about and, heading eastward, glided out over the Atlantic Ocean. Mrs. Denby was given the wheel and, with a few lessons, piloted the craft with ease. After an hour's sail the *Shenandoah* returned to the hangar.—*New York Times*, 11 October, 1923.

NEW YORK-FRISCO AIR MAIL ROUTE TO OPEN IN SPRING.—Washington, October 11.—The New York-San Francisco air mail route, with lighted night flying between Chicago and Cheyenne, will be opened about March 1, Second Assistant Postmaster-General Paul Henderson announced today, speaking before the National Association of Postmasters, in convention. Mr. Henderson said it was hoped transcontinental flights would be made regularly in twenty-seven or twenty-eight hours.

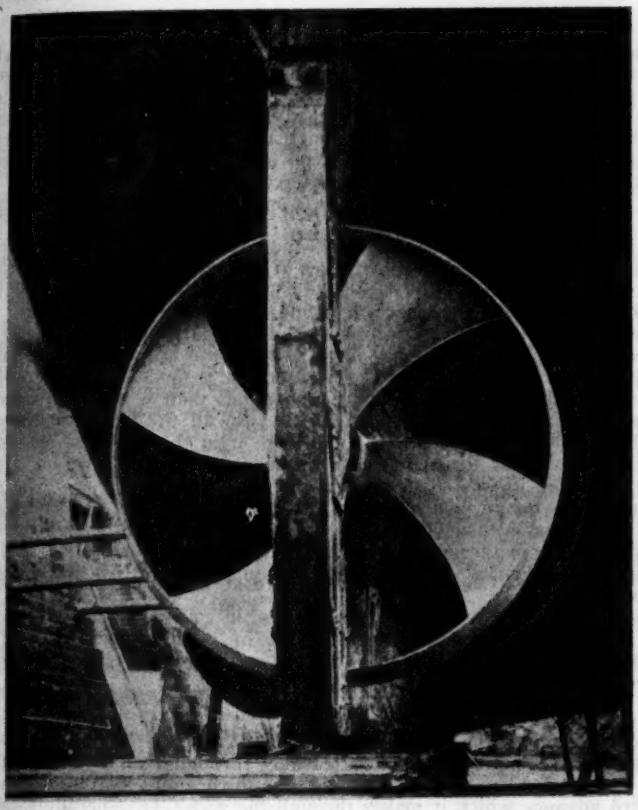
Night flying in illuminated airways was said by Mr. Henderson to offer possibilities of regular service between New York and other principal cities.—*Baltimore Sun*, 12 October, 1923.

ENGINEERING

THE GILL SHROUDED PROPELLER. SOME NOTES ON ITS INCEPTION, CHARACTERISTICS AND APPLICATION.—The idea that a screw propeller fitted with a shroud should possess advantages over the open screw has occurred to many investigators during more than sixty years past. Attempts to realize these advantages did not, however, meet with conspicuous success, for a screw propeller fitted with a shroud was invariably found to be inefficient as compared with the open screw. Some sixteen years ago the designer of the Gill propeller was induced, by experience of certain propeller troubles, to consider the apparent possibilities of the shrouded type of screw and to attempt an analysis of its defects. The subject was worked at intermittently during a period of over ten years without any definite advance on the results obtained by former enquirers. When investigating during 1915 the then unconnected subject of flow in nozzles and bellmouths, however, it occurred to the designer that a definite connection exists between the design of particular forms of nozzles giving high coefficients of discharge

and that of a shroud correctly applicable to the flow conditions through certain screw propellers. This connection was further supported by detailed consideration of Mr. R. E. Froude's theoretical conception of an imaginary "actuator" and tube.

It received additional justification during 1919 by deductions based on certain experimental results which were published by Sir Charles Parsons and Mr. S. S. Cook. A new series of experiments was therefore com-



VIEW OF THE PROPELLER AS FITTED TO THE SALVAGE VESSEL "RINGDOVE'S AID."

menced with various types of nozzle-shaped shrouds and with model screw propellers, treated both independently and together, with the result that, in 1920, a screw propeller, having axially increasing pitch and a nozzle-shaped shroud of particular form and proportions, was first produced. This propeller gave practical results definitely better than those obtained with certain good typical screws of the open type. It was followed during 1921 by the production of a number of gradually improved screws of the same class and various proportions. During 1922 a consistent series of excellent results was obtained with such propellers, fitted to a great

variety of craft and ranging from 1 ft. to 6 ft. diameter. By the end of the first quarter of 1923 a sufficient quantity of full-scale trial results had been collected to permit of an analysis of the leading proportions which resulted from the successful combination of theory and practice. This analysis has rendered possible the standardization of the features of design to the extent that all ordinary cases in practice can be met from a set of type drawings and patterns.

Description of the Propeller

The Gill propeller consists of a screw, having two or more blades, which are mounted at their inner ends on a boss, or hub, and fixed at their outer ends to a shroud of special form, surrounding the screw. The shroud contracts in nozzle shape from the forward to the after end of the propeller, and the working pitch of the blades increases axially in the same direction. The blades and the shroud are designed to produce regular acceleration in the stream acted upon, according to the recognized laws of fluid flow. The boss, blades and shroud constitute a complete propeller, and rotate as a unit.

A typical open propeller with a shroud fitted to it would not constitute a satisfactory shrouded propeller, even if the shroud were of good form. In the first place, it would overload the engine to which it had hitherto been suited, and, in the second place, it would lose much of its efficiency. The theoretical considerations affecting the design of the Gill propeller are somewhat complicated, for they have to take into account a great variety of factors. In practice, however, this propeller is made from ten to fifteen per cent smaller in its determining proportions than is an open screw for the same installation. This is chiefly because all the water which enters a Gill propeller is compelled to go through it in the direction required to produce reaction or thrust, and the propeller, therefore, takes on a more direct load for its size than does the normal type of screw. The same feature serves to furnish a reason for the fact that this propeller gives effective results, even under conditions of obstructed and oblique inflow, in addition to partly accounting for its freedom from vibration, and explaining the remarkable initial acceleration displayed by any vessel to which it is fitted.

The distinguishing feature of this screw, in causing all the water acted upon to be thrust directly astern, is one of great importance, for it is obviously impossible to develop a full forward reaction from water which is thrown out divergently.

Slip

This introduces the much misunderstood subject of "slip," and it is well to note that a propeller, whose advance through a solid "nut" would be from one and a quarter to one and one-third times that of the actual forward advance which it makes through the water, is, generally speaking, more efficient than propellers with less so-called "slip." A further notable feature of this propeller is that it produces better results when working under very shallow immersion than do open screws under like conditions, being distinctly less liable to "break surface" than are screws of the open type and being less affected by the air taken down when this does occur. Among objections which have been advanced, the first is usually the increased frictional surface due to the shroud. This would be valid except for the fact that considerably more useful effect is produced by the shroud than is lost by its surface friction. The next objection frequently raised is that the shroud should preferably be fixed, with the propeller rotating within it. Such an arrangement would be unsound hydraulically on account of excessive eddy losses, and unsound mechanically by reason of the difficulty of maintaining alignment in service.

Another objection put forward is, that solid objects may become wedged in the propeller, but it is found in practice that, if too large to go through, they are thrown off Further and more far-fetched objections are the centrifugal tendency to bursting of the shroud and the possibility of its acting as a "drogue." These suppositions lose sight of the fact that, owing to the velocity of flow, the internal pressure is much lower than that outside the shroud, while in true nozzle flow the pressure normal to the internal surface of the nozzle has a zero value.

Recent Results

A recent case in which one of these propellers, of medium size: viz., 10 ft. 6 in. diam., had been applied to a steam-driven vessel of 1,200 i.h.p. with very good results, is that of the salvage ship *Ringdove's Aid,* belonging to the Falmouth Docks and Engineering Company. This vessel is a composite-built ex-naval sloop, almost identical with H.M.S. *Greyhound,* made famous by Mr. W. Froude's classic towing experiments, and very suitable for salvage work. A new and specially-built set of compound engines, by J. Samuel White and Company, Ltd., has recently been installed, and ample propulsive data being available for this vessel, it was calculated that a sea speed of 11 knots was to be expected with the 1,200 i.h.p. and a good four-bladed propeller running at 120 r.p.m. In view of the successful results obtained with Gill propellers as applied to smaller craft in the service of the same company, however, it was decided to fit one to this salvage ship, and the screw was cast in iron at the works of Cox and Company, Ltd., 17, Victoria Street, London. A series of trials of the installation was carried out during the first week in July, and it was found that the speed of 11 knots could be attained with about eighty per cent of the indicated horsepower and ninety per cent of the revolutions per minute which were calculated as being required for an open screw. It was also found that the ship handled and steered with remarkable ease, even down to the working condition of just "turning over" at 12 r.p.m., while she could be stopped in seventy seconds from ringing down, when running at 10 knots, and showed notably rapid acceleration both "ahead" and "astern." It was also observed that the propeller displayed no tendency to race when breaking surface in heavy swell or to "cant" the ship when going from "ahead" to "astern." The performance of the propeller on this vessel is stated by those who witnessed the trials to be remarkable and conclusive, while it is reported to be equally satisfactory on the emergency service in which the vessel has been subsequently engaged, a speed of 11.5 knots having been attained.

It is also interesting to note that, when fitted to a large steam tug on the Thames, the propeller produced towing and steering results admittedly five per cent better than those attained with the best open propeller, in addition to eliminating the troubles of damage to blades, while when fitted this year to a large motor-driven canal tug at Liverpool, it gave a notably better towing speed than four open propellers of the best makes, previously tried on the same boat, and also proved immune from fouling troubles.

Maneuvering Powers

The stopping and maneuvering powers developed by the Gill propeller appear to be quite good, and a ship so fitted answers her helm readily down to the lowest speeds. It has also been found to obviate squatting action at the stern and to leave a relatively smooth propeller wake.

The latter should prove a valuable attribute in the case of vessels operating in narrow rivers and canals. The employment of this type of shrouded propeller is not confined to any one class or size of vessel, for it is upheld that its range of utility is considerably wider than that of the open screw.

Its adoption in the case of vessels previously fitted with an open screw

or screws does not involve any structural alteration or additional fittings to the hull or power plant, whilst its inclusion for a vessel in the design stage should permit of higher revolution speeds being employed with resulting economy in weight, bulk and cost of propelling machinery.—*The Marine Engineer and Naval Architect,* September, 1923.

AIR HEATING BY WASTE GASES.—THE USES AND OPERATION OF THE HOWDEN-LJUNGSTRÖM AIR PREHEATER.—In the general desire, in the marine engineering world, for the reduction of the cost of steam power, the attention of inventors has been directed hitherto almost exclusively to the improvement of the performance of the prime mover, and remarkable progress has been made in the economical use of steam, while the really fundamental question, that of the economical production of steam, has attracted comparatively little attention. The importance of the recovery of heat from the waste gases, however, was early recognized by the firm of James Howden and Company, Ltd., and a further important innovation in this connection has been placed on the market recently by the firm of Ljungström, of Stockholm. Ljungström's, very early in their experiments, realized that maximum economy could be obtained only by utilizing the heat contained in the waste gases to an extent much greater than had been common before, and it was with this object in view that the Ljungström air preheater was invented. Trials were made and the apparatus was proved to be satisfactory practically from the beginning. It was seen that the principle lent itself readily to the design of preheaters for many types of furnaces, especially for those of marine steam boilers of all kinds.

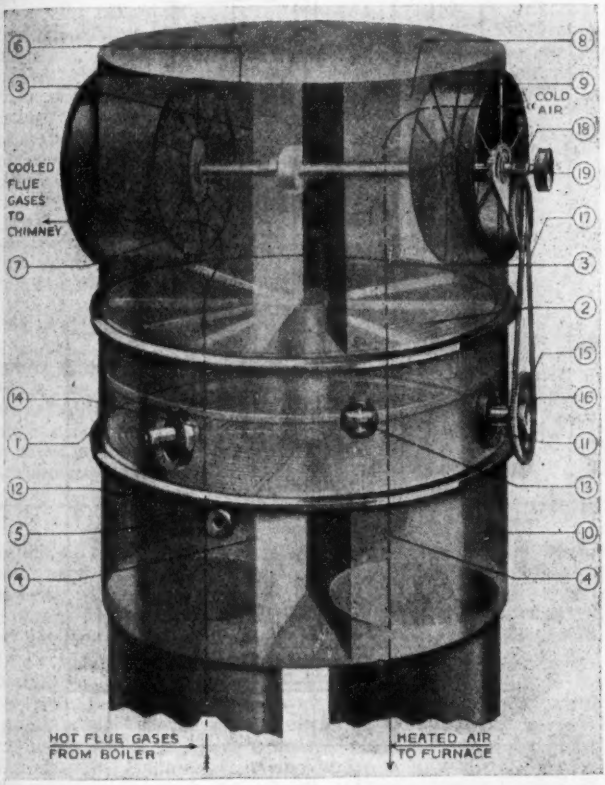
The principle involved is exceedingly simple and effective. Briefly described, it is somewhat as follows: A large transmission surface is assembled in a rotating part in such a way that the elements are alternately traversed by the waste gases from the boiler and the cold air to be used for combustion. The gases give up their heat to the elements, and as these move round into the current of cold air, the heat previously given up by the gases is taken up by the air. The process, it should be noted, is continuous.

In actual construction the elements consist of thin plates of metal placed close together and corrugated in order to obtain a very large surface. They are fixed in the rotor, which is of disc form, in such a way that the passages for the gas and the air between the plates are parallel with the axis of rotation. The rotor is supported upon rollers carried in ball bearings fixed in a stationary cylindrical casing, so that the power required to drive the rotor is only a fraction of a horsepower.

In the sections above and below the rotor the casing is provided with inlets and outlets in such a way that the gases and the air traverse the rotor in opposite directions, and a counter-current effect is produced. The gases and the air are separated from each other by diametral partitions in the upper and lower sections. In the upper section two fans are provided, one to force the cold air through the elements which are at the moment traveling through the air aside of the heater, and the other to suck the gases through the elements on the gas side. The two fans are mounted on one shaft passing through the upper partition. The shaft can be driven by an electric motor or in any convenient way, the rotor, which in all sizes revolves at 6 r.p.m., being driven by suitable gearing.

By this simple mechanism it is possible to reduce the temperature of the waste gases leaving the boiler to a point hitherto regarded as impracticable. From seventy to seventy-five per cent, according to circumstances, of the heat contained in the waste gases, can be recovered, a result impossible with heater of the ordinary type without a very large and costly extension of the surface and a great increase in weight and in space occupied.

An important feature of the heater is the ease with which the surfaces of the elements can be kept in practically their original clean condition. It is only necessary to fix a radial steam pipe, fitted with nozzles, below the motor on the gas side to enable the surfaces to be cleaned thoroughly at convenient intervals. During each revolution of the rotor every portion of the elements must pass through the path of the steam jets below them.

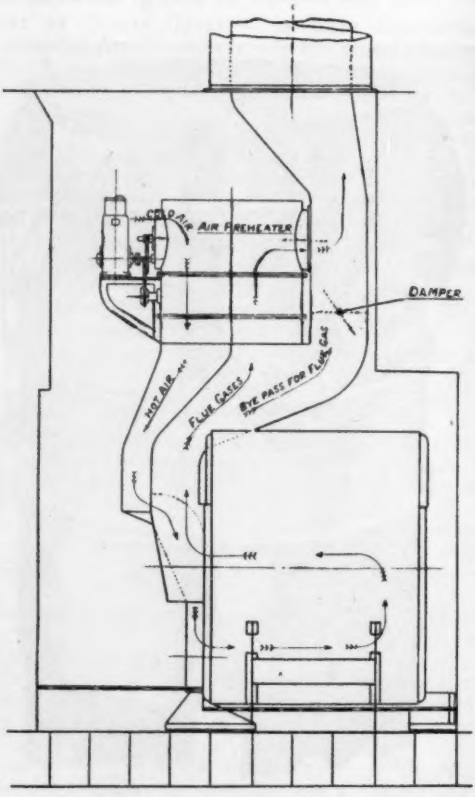


1. Rotor.
2. Heating elements.
3. Upper partition wall.
4. Lower partition wall.
5. Lower flue gas chamber.
6. Upper flue gas chamber.
7. Flue gas fan.
8. Upper air chamber.
9. Air fan.
10. Lower air chamber.
11. Driving roller.
12. Soot blowing device.
13. Guide roller.
14. Carrying roller.
15. Sprocket wheel.
16. Clutch.
17. Chain.
18. Speed reducing gears.
19. Pulley.

DIAGRAMMATIC VIEW OF THE HOWDEN-LJUNGSTRÖM AIR PREHEATER

No part of the surface of the elements can escape the scouring action of the steam. Every particle of soot is blown away, and the efficiency of heat transmission maintained constant. It is necessary to operate the jets every few hours for about fifteen seconds only, and the consumption of steam for this purpose is, therefore, negligible.

The firm has secured, we understand, the exclusive rights for the application of this apparatus to marine work throughout the world, and has obtained a license for land installation also. The Howden-Ljungström preheater itself has been thoroughly standarized in all sizes, but special consideration will be necessary in some cases.



THE HOWDEN-LJUNGSTRÖM AIR PREHEATER APPLIED TO SINGLE-ENDED MARINE BOILER

We append herewith some interesting test figures which were obtained from a cylindrical type marine boiler fitted with one of the preheaters described above. The boiler had two furnaces, each having a diameter of thirty-one and seven-eighths inch and a total heating surface with coal of 910 square feet; the corresponding heating surface with oil, the bars being removed. Retarders were in position in the tubes. The results are as follows:

Conditions	Coal-burning		Oil burning	
Date	31.1.23	14.2.23	5.3.23	6.3.23
Duration, hours	5	4	4	4
Steam pressure, lbs. per sq. in.	164	167	161	161
Average feed temperature, deg. F.	180	165	179	172
Class of fuel	Scotch coal	Scotch coal	Mexican oil	Mexican oil
Calorific value of fuel, B.T.U.	13,055	12,300	17,574	17,574
Fuel burned per hour, lbs.	540	636	453	495
Equivalent evaporation per lb. Fuel, lbs.	11·12	10·19	15·97	15·76
Equivalent evaporation, sq. ft. Heating surface, lbs.	6·6	7·12	6·99	7·54
Temperature of flue gases entering air preheater, deg. F.	538	561	537	554
Exit temperature flue gases, deg. F.	217	231	195	215
Temperature air entering fan, deg. F.	76	66	77	77
Temperature of air leaving preheater, deg. F.	419	427	426	427
Temperature of air entering furnaces, deg. F.	405	415	398	409
Air pressure in reservoir around furnaces, inches W.G.	0·35	0·34	0·31	0·32
Air pressure at furnace door, inches W.G.	0·06	0·02	0·16	0·15
Air pressure at ashpit door, inches W.G.	0·30	0.30	0·24	0·23
CO_2 in flue gases, per cent	9·5	9·0	11·1	11·0
Thermal efficiency of boiler	84·36	85·49	87·6	87·13

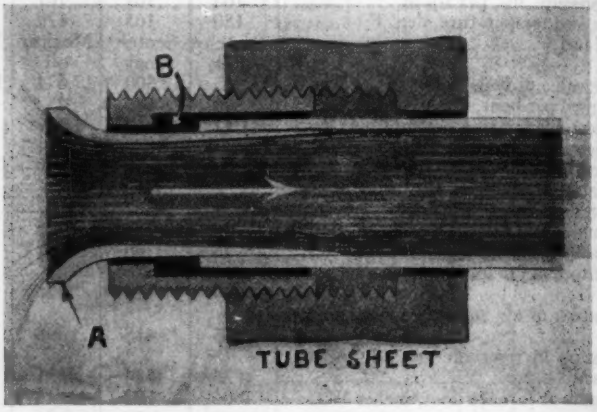
The results of these trials, which were very exhaustive, show that the funnel losses need not exceed six per cent, the net efficiency obtained at the same time being in the neighborhood of ninety per cent. This performance, although obtained under test conditions, indicates that it is possible to effect fuel savings of from twelve per cent to twenty-three per cent according to circumstances, by extracting heat from the waste gases.

It is certain that in some cases the boiler efficiences obtained in actual practice at sea are low, but with even the best supervision there still remains great scope for the improvement of the efficiency of the boiler plant itself in absorbing the heat generated in the furnaces by either solid or liquid fuel. The cylindrical marine boiler, which has been applied to many millions of horsepower, has shown itself capable of giving excellent results. From furnace to smokebox it is hermetically sealed and its radiation losses are low, but the gases enter the smokebox at comparatively high temperatures. Even with careful attention the efficiency may be as low as seventy per cent, and it is possible, under less favorable conditions, for as much as thirty-five per cent of the calorific value of the fuel to be allowed to escape to the funnel. This question of the recovery of heat from the waste gases is, therefore, of fundamental interest.—*The Marine Engineer and Naval Architect,* September, 1923.

Entrance Nozzle for Condenser Tubes.—Among the many factors affecting the life of condenser tubes, general corrosion is probably the most common and can usually be attributed to one or a combination of causes. It is now generally conceded that the entrained and dissolved air in the circulating water is responsible for much of the corrosion action and that

the life of condenser tubes depends quite as much on the character of the water as on the properties of the tubes.

With a view to eliminating the corrosive action due to the gas pockets formed at the inlet end of the tubes (as at *B*) the nozzle *A* shown in the illustration has been developed. The nozzle, when placed in a tube as shown, tends to prevent the contraction of the jets of water as they enter the tube and thereby stop the liberation of oxygen at that point.



VENTURI NOZZLE PLACED AT INLET END OF TUBE

The design of the nozzle is such as to produce a venturi action and to increase the flow of water through the tubes.

The nozzles (known as Flowrites) are made in sizes to fit standard-diameter tubes and when in place form a practically continuous inside wall and provide a smooth entrance to the tube. They are manufactured and distributed by the Albert E. Mace Company, 755 Boylston St., Boston, Mass.—*Power*, 9 October, 1923.

THE GEARED DRIVE.—There is a variety of interesting matter in the short paper which Professor Dresden read at the recent meeting of the Institution of Naval Architects, but it is not surprising that the discussion turned almost solely upon the reducing gear of turbine-driven ships. Wherever marine engineers and naval architects are gathered together, this subject arises sooner or later. There may be some bold enough to deny that there is any cause for anxiety in the present conditions, they may tell us, as Mr. R. J. Walker did in Holland, that there are five hundred merchant ships, with a total of two and a-half million horsepower, fitted with turbines and reducing gear; they may assert that the rigid double reduction gear is not nearly as bad as it is painted; and that the number of breakdowns is inconsiderable. All this they may do, but the fact remains that anxiety does exist amongst marine superintendents and shipowners, and that there is still not that complete confidence in the turbine and gearing that there is in the reciprocating engine. In some quarters this anxiety is so great that old-fashioned reciprocating engines are ordered despite their lower efficiency, in preference to geared turbines, or, as in the case of the 65,000 horsepower fast cruisers for the Dutch Navy, which are now being constructed, direct coupled turbines are being employed, so that the uncertainty associated with gearing may be avoided. In these circumstances, it is

idle to deny that the matter is serious. Whatever statistics may say, the fact remains that marine engineers are not perfectly happy with the geared drive.

In the early days of turbine gearing, a clear division of practice took place. On the one hand, American engineers, led by George Westinghouse and Colonel Macalpine, decided that a rigid connection between the pinion and wheel shafts would lead to trouble; whilst, on the other, British engineers, with Sir Charles Parsons at their head, contended that if the gear were properly cut, the flexible connection was unnecessary. To the latter opinion British engineers have held ever since, and it is only within the last few months that some sort of doubt as to its wisdom has begun to arise. The view is, we believe, gradually gaining ground that the conditions on shipboard are such that, even with practically perfect gears, a certain amount of flexibility is desirable. For ourselves, we have never been able to understand why geared turbine builders in this country persisted in the belief that the gear casing was rigid. That they did do so is obvious from their adherence to rigid gears, for it is clear that rigid gearing can only work accurately in a rigid casing. The slightest straining of the casing leads to disalignment of the bearings, disarrangement of the tooth contact, and the creation of unknown stresses. To make a casing that will not distort in some degree under the influence of the working of the ship in a seaway, under changes of temperature and other possible forces, is, we hold, impossible, and despite the success attained with the majority of British-built vessels, we are disposed to agree with the American view, and to support Professor Dresden's opinion that a flexible connection reduces the chances of failure. It is to be regretted that at the meeting in Holland there was not present some engineer, conversant with American practice, who could have given figures to show the immunity or otherwise of the Macalpine floating-frame drive. If it can be shown that that device is not consistently successful, then we must accept the British view that failures of marine turbine reducing gear are caused by bad gear cutting, bad lubrication, bad metal, bad alignment, excessive tooth pressures, or any other of the causes usually assigned. If, however, that gear is consistently successful, other things being equal, then we ought to admit at once that we have made an error in adhering so long to the rigid drive and reform our practice. Indeed, the whole subject is one on which greater flexibility of thought and more daring in experiment is needed. Take, for example, the question of the use of helical gear. Of its merits we are all well aware, but we must equally admit that it has very serious faults, of which the difficulty of accurate production is, perhaps, no longer the first. In that position we are inclined to place the necessity for lateral stability, for considerable stresses may be set up by trifling endways movement of the pinion. Recent improvements in the production of straight gears have shown conclusively that they can be made to run as silently as double helical gears; they are more easily produced with a high degree of accuracy; and small lateral movements are immaterial to them. We should be glad indeed to see an experiment made with a small set of these hardened and ground gears in a ship. Transmissions of 500 horsepower have already been constructed, and we have little or no doubt that double that amount could without great difficulty be provided for.

But there is another aspect of this subject which is rarely mentioned, but which Professor Dresden may have had in mind when he wrote: "There is always the possibility that it [double reduction gearing] will, in its turn, be superseded by the next step in the direction of progress. The author does not want to prophesy——." It must be remembered that the propeller was invented for use with relatively slow-speed reciprocating engines. With the steam turbine it forms an ill-assorted pair. It ought, rightly, to be regarded as a makeshift to enable the advantages of the

high-speed turbine to be secured under conditions which are properly those of slow-speed engines. What is required now is not so much improvement of reducing gear as the discovery or invention of a new means of propulsion which is suited to turbine speeds. Speed reduction by gearing, by hydraulic appliances or by electric generators and motors must all be placed in the same category. They are unnecessary with the reciprocating engine; it should be the constant aim of inventors to make them unnecessary with the steam turbine.—*The Engineer*, 14 September, 1923.

ORDNANCE

THE GERMAN LONG-RANGE GUN.—Ever since the famous long-range guns bombarded Paris from March 23 to August 9, 1918, discussions of these unusual weapons have appeared in print almost monthly, some of them giving a few correct details of the design field operation, effect, etc., and others so lacking in accuracy as to be fantastic. It therefore seems pertinent to summarize here what has been learned about these mysterious and highly valued guns since they made their appearance on the Western Front, just two days after the German Armies began their famous final series of offensives which led to their downfall.

Some of the articles which have appeared to date on the long-range guns, and which seem worthy of consideration from the standpoint of accuracy, are, in the order of their appearance:

1. *Genie Civil* (French), April 20, 1918—"Reconstitution and measurement of projectiles."

2. *L'Illustration* (French) January 4, 1919—A general article on the effect of the bombardment.

3. *Journal of the United States Artillery*, September, 1919—By Col. E. M. Blake—Battery positions, counter measures.

4. *Mechanical Engineering*, February, 1920—By Col. H. W. Miller—The gun, carriage, projectiles, and the general effect.

5. *Munchener Neueste Nachrichte*, March 29, 1920—The battery positions.

6. *West Deutsche Randschau*, 1921—Battery positions.

7. *Hearst's International*, December, 1921—By Col. Max Bauer—Design, process of construction, test, and use of the guns.

8. ARMY ORDNANCE, January-March, 1921—By Major K. F. Adamson—Design and life of the gun, projectile, etc.

9. An article given in a German publication and partially reprinted in *Minneapolis Tidende* for February 23, 1922, by Commander Walter Kinzel—Design and construction of the guns, battery positions, field service and withdrawal.

10. "*Hamburger Correspondenz*," April 13, 1922—Anonymous—History and fate of the guns.

In addition to the information printed in the above-named articles a number of interviews have been held with men of the German and Austrian services in which information has been secured. It will be obvious to the reader that a very serious attempt has been made by the Germans to keep the details of design of this weapon secret. They are fully justified in this for it is a real achievement. They sprung the guns as a complete surprise in the spring of 1918 and withdrew them into Germany in the summer of that year, retaining them until after the signing of the armistice when they began to cut them up and melt them in the furnace. They were obligated by the terms of the Peace Treaty to turn over one of the guns but they never complied with this order. No officer of the Allied Armies has seen any of the guns and the several hundred men who worked on the design and manufacture of them and who operated them in the field have been muzzled so effectively that only the two listed above (7 and 9) and

the few that will be mentioned herein have ever intimated that they knew anything about them or have described them in such a manner as to indicate that they knew what they were talking about.

Motive for the Construction of the Guns

It has probably been the natural assumption that the guns which go by the name of the Long-range Guns were constructed especially for the bombardment of Paris. There is no record to the effect that any other place was shelled by these guns, so the assumption would be a natural one. Apparently this was not strictly the case, however.

"Long-range guns carrying up to twenty-five miles or even a bit more were no novelty in the navies of the world when the World War broke out, but a range of twelve miles appeared sufficient for all purposes of land warfare." (7.)

"Trench warfare required among other things a weapon which the army did not possess: viz., a very heavy flat trajectory gun of the largest caliber and very longest possible range. It was no longer a case of attacking fortresses and battering their camouflaged concrete and armored structures to pieces by heavy high-angle fire. It was now a question of reaching out a few dozen kilometers behind the lines, taking rear communications, depots, camps, staff headquarters, trans-shipment stations, railway stations under fire, harassing and rendering uninhabitable large towns and troop concentration points far behind the front, and pushing the enemy's safety zone as far back from the fighting troops as possible.

"Rear Admiral Rogge, chief of the department, set the example and we followed it, and they strove at Essen to emulate us. And the results were not lacking, for the first twenty-eight centimeter long-range gun was in position opposite Verdun a few months after the outbreak of the war, and others followed shortly after. Each new gun showed an improved construction in the bed plates of the gun carriage, loading apparatus or ammunition.

"The desire to increase the range of heavy naval guns arose very soon after the beginning of the trench warfare of unhallowed memory. There were certain targets a long way behind the rigid front which it was tempting to take under heavy fire now and then. Our aerial attacks often showed very good material results, but the aviators were always reported long before they had reached their objective. An entirely different moral effect could be obtained by making distant main strong points, harbors, etc., feel that they could be bombarded by heavy guns at any time of the day or night without previous warning.

"Nothing much could be done with a range of about thirty-five kilometers, which was the maximum distance that our heaviest naval guns could then carry. It was necessary to get more range from the guns and at least reach Dunkirk, which was about forty-five kilometers distant from the westernmost heavy batteries in Flanders.

"This task was finished very quickly. A hail of thirty-eight centimeter shells fell on Dunkirk for the first time on April 28, 1915, and the town was never free from bombardment after that date. It was soon learned that the great harbor traffic of this channel port, so important in bringing up men, ammunition, and supplies, was almost completely paralyzed." (9.)

"The Navy had already made considerable progress along the line of extreme ranges. This too was largely the work of Rausenberger, who, with the assistance of Admirals Rogge and Gerdes, had some time earlier constructed for the new dreadnaughts a thirty-eight centimeter cannon which was the peer of any ship's gun in the world. After certain changes in the carriage some of the guns had been brought to the front in Flanders, and the enemy was unpleasantly surprised when shells began to fall in the city of Dunkirk. . . . This range served our purposes for some time, but

eventually our enemies readjusted their dispositions accordingly, taking their staffs and rest quarters farther back and entraining and detraining their troops at railway stations outside the reach of the thirty-eight centimeter guns." (7.)

"It was possible in 1917, with the aid of other and especially efficient guns to take St. Omar, and Doullens, the enemy's main points of support and railway junctions, under fire from the vicinity of Cambrai at the distance of sixty-kilometers. The experiments which led up to this success offered much that was surprising and highly interesting regarding the relationship between height and length of trajectory.

"To an inquiry in the spring of 1916 as to whether the Army High Command would consent to appropriations of money, materials and forces for the construction, probably possible, of a gun of 100 kilometers range . . . General Ludendorff, usually so brief and cool in his writing, replied with evident warmth and encouraged us to carry out the work. . . . *We had sufficient ground to work on to enable us to calculate and deduce that it could be done.* We had most thorough and expert assistance in the realization of the idea in the technical management of the artillery department of Krupps. We began the preliminary work and calculations at full pressure.

"After we had worked three-quarters of a year, Ludendorff surprised us with a brief telegram: 'Please take range of 120 kilometers instead of 100 as basis for future work on long-range gun.'

"Finally we reached the stage at which it was possible to make the first test with the long-range gun at the firing range." (9.)

The first trials were failures. After the projectile had been fitted "with the new point and iron guide ring," the gun was tested again. . . . This time "the shell fell exactly where our calculations had shown that it should fall. The problem was solved. And then for the first time the idea of the bombardment of Paris popped up. Not a soul had thought of it before; the French railway lines and harbors had been in our minds." (7.)

The indications from the above quotations are that the Germans strove constantly from the beginning of the war to produce guns of greater and greater range in order that they might reach farther and farther back of the Allied lines, even to the larger railway centers and harbors. In developing these guns they kept constantly in mind the interesting "relationship between height and length of trajectory." Their calculations indicated that if a projectile could be given the initial velocity of approximately 1,600 meters (5,250 feet) per second it would traverse the distance of seventy-two miles if started at an elevation of fifty-five degrees, because during most of its period of travel it would be passing through atmosphere of such rarity as to oppose relatively little resistance to its flight and cross-currents of air would have relatively little tendency to cause the projectile to drift off its theoretical path. Vigorous investigating and experimenting made them certain that such a muzzle velocity could be attained. This it was that led them to suggest the 100 kilometer gun.

The relationship between height of trajectory and range for extreme muzzle velocities was not known to the Germans alone. In the *Scientific American* for April 8, 1916, Colonel Alston Hamilton published an article entitled "The Extreme Ranges of Modern Guns" in which he included two tables giving ranges, heights, and time of flight for various muzzle velocities *in vacuo* and in atmosphere. He gave the maximum range for a muzzle velocity of 5,000 feet per second as 147 miles *in vacuo* with a height of trajectory of thirty-seven miles. The extreme range for the existing 16-inch gun at a velocity of 4,000 feet per second in atmosphere was given as eighty-five miles with a height of twenty-two miles. The

theory was therefore quite generally known. Practical methods for attaining such muzzle velocities, however, were not.

Colonel Bauer says that no one had in mind the idea of bombarding Paris. On the other hand, Commander Kinzel says in discussing the proposed range of 100 kilometers: "Our most advanced trenches were ninety kilometers from Paris at that time." Later, on receipt of the telegram from General Ludendorff instructing them to take 120 kilometers as the basis of future calculations, he says: "That was easy to read and understand. The retreat to the Siegfried position had been decided upon in the meantime, and our lines moved from ninety to 110 kilometers from Paris."

Apparently then one may take his choice of the direct motives for the construction of these unusual guns. There seems good reason to believe that they were proposed and agreed upon primarily for the purpose of bombarding the larger cities, railway centers, harbors, and larger troop concentration centers far back of the lines, and that Paris, among all of these objectives proved so much more enticing than the others that it received the full attention of all of the first few guns constructed.

The Design and Construction of the Gun

In the research work incident to the design and construction of the guns which Commander Kinzel says bombarded St. Omar and Doullens from near Cambrai at a range of about sixty-two kilometers, the Germans developed practical methods of attaining muzzle velocities far in excess of the usual. According to information secured by the American Army Commission composed of General Wheeler, Colonel Hubard, Dr. Cottrell, and Captain Schaller, on their visit to the Skoda Works at Pilsen in May, 1919, the German investigations showed the following relation between muzzle velocity and elevation for maximum range:

Muzzle Velocity		Elev. for Max. Range
750 m.s.	2460 f.s.	42 degrees
850 m.s.	2790 f.s.	50 degrees
900 m.s.	2950 f.s.	52 degrees
1600 m.s.	5250 f.s.	55 degrees

NOTE.—No tests were made at velocities greater than 1,600 meters per second, but the investigators felt that no increase in range could be secured at elevations greater than fifty-five degrees no matter what the muzzle velocity.

The guns having a range of sixty-two kilometers had evidently been already designed and these calculations indicated that the difficulties involved in the construction of a 100-kilometer gun were not insurmountable. The instruction given by General Ludendorff to increase the range to 120 kilometers must have caused the designers no end of trouble. When one remembers that to increase the speed of a boat from 20 to 25 knots it is necessary to double the power; to increase it from 25 to 30 it is necessary again to double the power, it can be appreciated what was involved when ordered were given to increase the range of the proposed great guns by twenty-five per cent.

"It was only gradually that we realized the extra work this demanded, the calculations which had to be made afresh, abandoned and modified, and the difficulties entailed by increasing the range by twenty kilometers. . . . For a time we could only say that it had to be done; then gradually we had new ideas and found improvements to be made here and there, and when it seemed that the limit of efficiency of the materials had been reached it was boldly passed by utilizing new technical inventions.

"In the first place there were the problems of interior ballistics. Who could solve them fully? Who could watch the details of the process when

the pressure in the barrel rose within a hundredth of a second from normal to 3,500 kilograms per square centimeter (67,000 pounds per square inch). . . . An idea had to be formed by means of calculations as to how the chamber of the gun should be made, what the size of the charge, weight of the projectile, and what kind of explosive should be used. . . . All former experiences gained at artillery ranges were brought forth and studied with painstaking exactitude. . . . A number of new and daring experiments were carried out. Many of them were encouraging." (9.)

The results of tests and calculations indicated that the economic diameter or caliber for such a gun was about eight inches or 210 millimeters, the weight of the projectile about 120 kilograms (264 pounds), the powder charge 240 kilograms (525 pounds), and the powder chamber three meters (about ten feet) long and cylindrical to receive the metal case in which the charge would be contained. To secure the velocity of 1,600 meters per second the gun would have to be at least 140 calibers long.

Shortly after the guns began their bombardment of Paris information leaked through to the effect that the guns had been made from thirty-eight-centimeter forty-five caliber naval guns. General Wheeler was told by an Austrian engineer who had seen the guns in action, that they had been made from thirty-eight-centimeter forty-five-caliber naval guns. He was likewise shown three such guns in the Skoda Works which were said to have been in process of transformation into long-range guns at the time of the signing of the armistice.

"Tubes 12 to 18 of the German thirty-eight centimeter quick-firing cannon, cal. 45, were utilized as a basis for the construction of the Paris guns. . . . There were therefore seven of these long guns in existence." (10)

"The outer tube was already available: the 38-centimeter naval gun." (7.)

Tubes 1 to 11 were probably used on the carriage emplaced at the village of Luegenboom in Belgium for the bombardment of Dunkirk, and on the 38-centimeter railway carriages used by the Germans on various occasions for the bombardment of depots and cities at long heavy-gun ranges.

These 38-centimeter guns were lined with 140-caliber 210-millimeter tubes.

"A 20-centimeter tube was cast and inserted in the big gun, which took the place of the ordinary jacket. This was merely a matter of usual construction. . . . The only undesirable but unavoidable thing was that the inner tube, being naturally much longer than the jacket-gun, projected far beyond the latter's muzzle." (7.)

Herr Langner informs us that "the 38-centimeter gun was fitted with two tubes, the one thirty meters long and inserted in the gun and afterward rifled, and the other six meters long, unrifled, and attached to the end of the rifled tube." Another report to the Chief Ordnance Officer, dated April 11, 1919, states also that an engineer of the Skoda Works gave the length of the 210-millimeter liner as thirty meters with a six-meter smooth-bore addition. A previous report dated November 22, 1918, says: "The P. W. had occasion to speak with a German colonel of artillery who knows well the details of the long-range gun which fired on Paris. The caliber of the gun is 210 millimeters and the length of the tube thirty-four meters. Three-fourths only of the length of the tube is rifled, to prevent excessive friction of the shell."

The tube which was approximately 140 calibers long, was rifled with sixty-four grooves having a constant pitch to the right of four degrees. This fact is known from the projectile which had two two-rifled bands about it, therefore a constant pitch or rifling, and the number of grooves of the projectile was sixty-four with the pitch noted above. The 240-millimeter projectiles showed the same number of grooves as the 210; no guns

were rebored to 260 millimeters to our knowledge. At least none of them were used in the bombardment. Probably the same number of grooves, 64, would have been used for this final caliber. We are still uncertain whether a series of hoops were shrunk on over the projecting portion of the 210-millimeter tube; presumably not, at least not over the entire length of the section beyond the 38-centimeter gun. It was inevitable that a gun thirty meters long would droop to a prohibitive extent, but apparently the Germans conducted their first trials at the proving ground without in any manner bracing the tube to hold it straight.

"The first few shots with full charges had been fired without incident, and we left the bombproof in which we had taken refuge against possible accidents and stood in the open in order to watch the gun in action. The very next shot ripped off some fifteen meters from the projecting end of the 20-centimeter tube and hurled it vertically into the air to a great height. The gun had to go back to the factory. There it was not only repaired, but also stiffened, for the first gun had shown a perceptible sag and each shot set it into wild vibration." (7.)

This same characteristic of the gun was commented upon by an engineer of the Krupp Works, to Major G. M. Barnes of the Ordnance Department, during the past year. This engineer said that they had very carefully braced the gun to prevent any droop, that is, to keep it perfectly straight. There is another interesting comment on this in the report before referred to of November 26, 1918, from the Assistant Chief of Staff, A. E. F., to the Chief of Ordnance Officer:

"On account of the enormous weight and great length of the tube, the latter curves slightly when the gun is laid. To remedy this a scaffolding was built to install a support above the tube by means of cables." (This was the report of a German colonel of artillery.)

It is probable that the tube was kept straight by steel rod trusses such as are commonly used to strengthen very tall flag masts. Three such braces, one on the top, and one on each side with the struts about midway or perhaps somewhat forward of the center would suffice. The full length of the original 38-centimeter gun would remain satisfactorily straight.

The six-meter smooth-bore section attached to the end of the thirty-meter rifled tube was probably a later development because they first attempted to use projectiles fitted with the usual copper rotating bands and unless there were two of these bands at some distance from each other such a projectile would be in effect a cone and would not fit in a cylinder. From the report quoted above with reference to the reason for not rifling the entire length of the gun it is perhaps natural to assume that on the failure of the copper-banded projectiles and the substitution of steel rifling on the projectile, additional velocity might be imparted to the projectile by the addition of this smooth bore section. This may be the "new technical invention" referred to by Commander Kinzel in his description of the manner in which they solved the problem of attaining a range of 120 kilometers as ordered by General Ludendorff. The rifled projectile was a cylinder and would fit in the smooth-bore section and although gases might escape through the grooves of the projectile, some additional velocity might be imparted. This smooth-bore section was attached in the field. It was recessed and threaded to screw onto the rifled tube and each had collars shrunk and locked on their ends to furnish an additional rigid connection.

All information gathered from various sources indicates that the powder chamber was approxiately three meters long and of a diameter equal to 210 millimeters plus twice the depth of the rifling. This chamber accommodated a metal powder case of its full length and the case was held in by the usual Krupp sliding wedge breech block with axial percussion firing mechanism. There is no reason why the original breech blocks of the

38-centimeter guns could not have been used and this was in all probability the case. There was no indication of a modification of this section of the three guns observed in the Skoda Works.—H. W. Miller, *Army Ordnance*, September-October, 1923.

NAVIGATION AND RADIO

Fog in the United States.—Marine Fogs.—Marine fogs, produced essentially by the mixture of air of different temperatures doubtless in many cases associated with a certain amount of eddy motion and by conduction, occur in three general districts; the Pacific coast, the coasts of the Atlantic and Gulf of Mexico, and the Great Lakes. Fogs of this group are really marine phenomena; but, as they often overlap the coasts, they must be considered in any discussion of the climatology of the United States.

Pacific Coast Fogs

Because of their frequency, their great latitudinal extent, and their peculiar importance in relation to navigation in a region where violent storms and high winds are rare, the fogs of the Pacific coast have been well studied. A few years ago the Marine Exchange of the San Francisco Chamber of Commerce was asked what proportion of the shipwrecks along the California coast was due to fog. The answer was, "All of them."

Marine fogs are a distinctive feature along the Pacific seaboard. At times they may extend along the entire coast from Puget Sound to southern California. Chiefly characteristic of the spring and summer months, they also occur in winter, but less frequently then. They have a much greater vertical thickness than the winter inland fogs, perhaps averaging 1,500 feet but rarely exceeding 2,000 feet. These fogs move in from the ocean, over which they extend for fifty miles or so offshore, with a westerly "sea breeze," arriving on the coast about or soon after sunset and disappearing in the early forenoon. They penetrate inland not more than a few miles. A fog which lasts through the whole day is a rarity in southern California.

Local conditions have much to do with the frequency, the duration, and the characteristics of these fogs. San Francisco, for example, is famous for its fog. Owing to the peculiar topograhpy in the vicinity of that city, where the Golden Gate offers a free entrance for the ocean fog, from May to October "with clock-like regularity great banks of fog march in every afternoon and cover the brown hills" (McAdie). During these fogs the lapse rate (i. e., rate of change of temperature vertically) is negative. On Mt. Tamalpais, for instance, it is about three times as great as in the "no fog" condition. The excessive diurnal heating of the interior valley during the summer months causes a strong indraft of chilly ocean air from the coast. This wind, which blows with velocities of twenty-five to thirty miles an hour on summer afternoons at the Golden Gate, carries the fog inland, where it is either dissipated or rises to form "high fog." Above the surface wind blowing in from the ocean below there is an easterly offshore wind. These ocean fogs, with the chilly onshore winds that accompany them, have doubtless contributed not a little to the popularity, as residential cities, of Berkeley, Oakland, and other places to the west of San Francisco Bay, here there is less fog and less chilly wind. When these ocean fogs rise as they drift to and over the warmer land they become high fog or stratus clouds. At San Diego this high fog is known as the "velo" cloud. It is the common cloud of early morning and is much like the low cloud hanging most of the time off the western desert coast of South America. Carpenter speaks of the velo cloud as reaching its perfection over the littoral region of southern California and as being the chief characteristic of the summer in the San Diego Bay district (March-October). The sun usually breaks through this high

fog about 10 A. M. on a normal summer day, the sky clearing shortly afterward and remaining clear the rest of the day until about sunset. The velo is less than 1,000 feet above the surface and never extends inland more than sixty to seventy miles from the coast.

In the opinion of the local meteorologists the marine fogs of the Pacific coast are chiefly the result of mixture. The warm, moist air moving toward the land from the ocean passes across the cold ocean current close to the shore, mixes with the colder air over that current, and is also itself chilled by conduction. It seems not to be the water vapor in the lowest levels which is condensed, but rather that of the higher levels. There is an interesting economic aspect of these summer fogs which has attracted some attention.

The fogs are most prevalent in the dry season, when for weeks at a time no rain falls in southern California and herbaceous vegetation dries up. While the fog itself rarely gives any measurable precipitation, it certainly helps somewhat to relieve the excessive aridity. Occasionally as much as 0.05 inch of water has been deposited in one night, and smaller amounts (0.01 inch) are oftener recorded. The famous redwoods of California (*Sequoia sempervirens*) grow on a narrow coastal strip within the fog belt and nowhere extend inland more than thirty miles. W. G. Reed notes that on the Berkeley hills during summer fogs small trees drip with moisture and the ground beneath the trees is moist to a considerable depth. Away from the trees, on the other hand, the ground is dry and powdery, and the grass is brown. No practicable method has yet been devised by means of which any considerable amount of fog particles can be collected and used for the benefit of vegetation.

Atlantic and Gulf Coast Fogs

The Atlantic coast fogs differ from those of the Pacific in their irregularity and lesser frequency of occurrence. The only portion of the Atlantic coast which in any way equals the immediate Pacific coast in fogginess is in northern New England. On the basis of over thirty years' observations Petit Manan, Me., holds the record for the largest average annual number of days with dense fog on the Atlantic coast. From New England southward there is a decrease in the number of fogs until, at Key West, a dense fog is a rare occurrence. A glance at any table showing fog frequencies, as, for example, the observations collected and published by the United States Lighthouse Service, shows how greatly these frequencies vary even within short distances. The location of a station with reference to near-by land and water areas, the surrounding topography, and the exposure to the wind are important controls of the amount of fog. Thus, certain islands, like Nantucket, and certain individual stations, like Cape May, N. J., have a good many more fogs than other places somewhat differently situated. Occasionally but rarely, it may happen that a belt of fog extends more or less along the whole Atlantic coast from Maine as far as northern Florida. As a rule, however, the fog extends only part way down the coast, perhaps as far as Boston or New York or somewhat farther, and in most cases the fog belt is found only off the coast of Maine. On the New England coast fogs are most frequent in summer when the temperature-differences between water and land are most marked and when the warm southerly winds blowing over the cold ocean water near shore are well moisture laden. Farther south the maximum fog frequency as a whole comes in winter and early spring. The frequent dense summer fogs on the New England coast are somewhat of a handicap to this locality as a summer resort.

Along the Gulf of Mexico marine fogs are not a significant element of climate except on the northeastern Texas coast. Their season is winter, and they vary considerably in number according to local controls, as is the

case on the Atlantic coast. On the basis of several years' record Pensacola has more fog than Tampa, Mobile, or Corpus Christi. Galveston has about twice as many days with dense fog as the three stations last named. *The Geographical Review*, October, 1923.

A SUBMARINE ERUPTION IN THE CHINA SEA.—On March 2, 1923, a submarine eruption was witnessed by a Japanese vessel off the southeastern coast of Indo-China in the direct steamship track between Singapore and Hongkong. Six days later a British vessel reported the existence on the spot of a small island "approximately 500 yards in length" in water fifty fathoms deep. The island was horseshoe-shaped, the mouth facing north or northeast, the slopes rising to a height of eighty to 100 feet at the west-southwest end where the ejected material was piled up under the influence of the monsoon (Two New Volcanic Islands in the China Sea, *Geogr. Journ.*, Vol. 62, 1923, pp. 35-38; and the additional note, p. 153). The island lies between Pulo Cecir de Mer and Great Catwick, the corrected position being latitude 10° 10′ 20″ N., longitude 109° 0′ 10″ E. In the previous month earthquake shocks had been felt by inhabitants of the former island.

On March 15-17 the French surveying vessel *Astrolabe* visited the island, taking formal possession of it (*L'île des Cendres, volcan indochinois récemment apparu, "Comptes Rendus de l'Acad, des Si."* [*de Paris*], Vol. 177, 1923, July 30, pp. 335-338). Great activity was displayed at this time. On April 5 when a geologist, M. Étienne Patte, was officially dispatched to the island it was much changed. Eruptions had ceased, and the island was reduced in size, the heels of the horseshoe having disappeared. The summit had the form of an almost horizontal arc of sixty degrees and was thirty-four meters high; the interior slopes appeared as part of a broken amphitheater; the exterior slopes were slightly convex, falling at an angle of nineteen degrees to the bordering wave-cut cliffs. On April 20 another earthquake shock was felt on Pulo Cecir and the adjacent mainland. The British surveying ship *Iroquois* reported the volcano still active on May 8 and a new islet 100 feet long and one and a half foot high formed two miles to the south of the first. On May 27, when M. Patte returned to the island, the cliffs had receded farther, though some protection was now afforded by the platform of marine denudation brought into being. The area of the *Ile de Cendres* was less than two-thirds that of April.

The spot where the eruption has taken place is not near any seat of volcanic activity of historic time. The material ejected, chiefly basaltic scoriæ, however, includes fragments of basalt antedating this last eruption, whence it evidently took place on the site of a former volcano or at least in a volcanic region. The island of Great Catwick is built of tuff and basalt, and on Pulo Cecir the remains of an ancient crater can be traced. Basalt flows are of common occurrence on the adjacent mainland, and from the way in which they occupy the present valleys they are obviously of comparatively recent origin.—*The Geographical Review*, October, 1923.

"MAJESTIC" ACCURATELY STEERED BY RADIO COMPASS.—The navigating and radio officers of the White Star liner *Majestic* have given out the following interesting information as to the use of the radio compass or direction finder aboard that giant vessel. On her recent voyage from New York to a dry dock in Boston and return, she was in fog nearly the entire time and was navigated almost wholly by radio bearings taken from the ship, using the radio beacons of the Lighthouse Service and radio communication stations on shore. Nantucket Lightship was made so exactly that the *Majestic* passed between the lightship and the near-by marking buoy.

On a recent voyage to Europe the *Majestic* was in fog for four days before reaching Cherbourg and was navigated by radio bearings in approaching the French coast and made the entrance to Cherbourg Harbor exactly by this means.

The radio direction finder is continuously used on the *Majestic* in locating, approaching, and passing vessels in fog for the purpose of avoiding collision. The commander of the *Majestic,* Commodore Sir Bertram Hayes, has become an enthusiastic believer in the value of this instrument in navigation. The direction-finding work on board the *Majestic* is given preference over any other work of the radio.—*The Nautical Gazette,* 13 October, 1923.

DEVELOPMENTS IN WIRELESS TELEGRAPHY.—*High-speed Apparatus.*—The very heavy traffic handled by the largest of the trans-Atlantic liners has brought about requirements for automatic transmission and reception, in order that the large number of messages with which they have to deal may be handled without monopolizing the attention of coast stations for an unwarrantably long period. The method adopted for obtaining high speed transmission in ships is as follows:

The aerial circuit is magnetically coupled to a closed circuit, which is kept in a state of constant oscillation by the transmitting valve. The coupling between the closed and open circuits is arranged in two equal parts which are opposed to one another. The act of signalling consists in short-circuiting one half of this coupling and so allowing the transfer of energy from the closed to the aerial circuit to take place through the remaining unbalanced portion.

In order to keep the load on the transmitting valve constant an artificial resistance is inserted in the closed circuit, which is short circuited at the same moment that the compensating half of the coupling coil is short circuited. This allows of fairly high speed transmission without the slightest trouble from sparking at the key contacts. Speeds from sixty to ninety words a minute are worked as the circumstances of the moment may dictate.

The source of supply is the standard nominal 1½ kw. valve transmitting panel, the supply to the anode of the transmitting valve being approximately 1.2 k.w. The aerial current for a prolonged dash is about seven amperes and the effective range of transmission at ninety words a minute is about 700 miles. The high speed keying is carried out by means of a Wheatstone or Creed transmitter working from a perforated tape.

The high-speed receiving apparatus consists first of all of the usual loosely coupled circuits tuned to the frequency of the wave which it is desired to read, the high frequency current being amplified by six high frequency valves working in a transformer-coupled amplifier of the well-known "55" type. The amplified current is acted upon by a local oscillator, the tuning of which is arranged to be very accurate, a tangent screw being fitted to the adjustable condenser in order that the beat frequency may be fixed with great accuracy. After rectification the rectified current now at the beat frequency is passed through a four-stage low frequency tuning circuit. This consists of a four valve low frequency amplifier, each of the grid circuits being tuned to the pre-determined beat frequency, the anode circuit of one valve being loosely coupled to the grid circuit of the next.

Such a device gives very considerable magnification to sounds of the pre-determined frequency, but the magnification is less than one to one for any signals differing by but a very small amount from the frequency of the filter. Hence the necessity for a tangent screw to give exceedingly fine adjustment of the local oscillator frequency, which of course determines the pitch of the beat note.

After passing through the filter the signals are again rectified and applied to the grid of the valve which operates the recording device. The anode current from this last valve is used to actuate the recorder, the current being to all intents and purposes a direct current whose strength varies between practically zero and about five milliamps. Extremely satisfactory results have been obtained at sea from undulators of the type introduced by Dr. MacLachlan. These are very reliable in operation and completely proof against vibration and movement of the ship.

Receiving speeds up to about 100 words per minute can be obtained by the means as described above when signals are strong.

The automatic recorder is exceedingly useful as, in addition to its use for the reception of high speed signals, it can also be switched on and allowed to record ordinary hand speed messages, such as press messages, while the ship's operators can be employed in reading messages on other wave lengths independently of the recorder. It should be realized that double reception, that is to say, reception of signals on two different wave lengths at the same time in the same ship, is now a common practice in these very large vessels.

Note Filters.—The recent rapid increase in the number of powerful wireless stations has made the reading of press messages in ships at sea exceedingly difficult, because there are many parts of the ocean where the received high frequency currents from the station whose messages it is desired to read are very much weaker than the high frequency currents received from other stations of very slightly different wave length. This means that two or more messages are audible in the telephones at the same time, and although they may all have different beat notes yet it is exceedingly difficult for the human ear to pick out the weaker sound which is required from among several louder sounds.

To overcome this difficulty, two-stage note filters, similar in principle to the four-stage note filters described above, are now in use. Although of course the tuning obtained is not so sharp as is the case with the four-stage note filters, yet it has been found sufficient and very greatly to simplify the problem of reading press messages in ships on the high seas.

It should be noted that these note filters are only of practical use for reading continuous wave messages in which the pitch of the note received can be varied at will by an alteration of the frequency of the local oscillations, and thus adjusted so that the desired signal is received at the beat note corresponding to the selective frequency of the filter. Filters are of no practical service for spark telegraphy because in this case the pitch of the note of the received signals depends upon the transmitter only and is not under the control of the receiving telegraphist.

Wireless Beam.—A great step in the adaptation of wireless telegraphy as an assistance to navigation has been taken in the production of what are known as revolving beam stations. These stations transmit a wireless signal on an exceedingly short wave (about six meters) in the form of a very fairly concentrated beam, and the whole apparatus of the transmitter can be rotated bodily on a turn table.

Special receivers suitable for this exceedingly short wave telegraphy can be fitted and by their aid the signals sent out by the revolving beam transmitter can be received. This altogether abnormal form of telegraphy is entirely free from interference from other signals, and in consequence there is no difficulty in reading simple signals such as the single letters transmitted by its aid. For this reason it is not necessary to make use of the services of a skilled telegraphist, and navigating officers have no difficulty in learning to use the receiver for themselves.

The arrangements of the beam transmitter are such that signals will fall to about half their maximum strength about ten degrees each side of the axis of the beam, falling away to practically zero a further ten degrees

each side of the axis. The method of signalling bearing by means of the beam is as follows:

As the projector is rotated a contact finger passes over studs on the turn table, which are arranged so as to produce a different letter, selected from the longer Morse letters, at each two points of the compass. A ship at the normal working range of the beam would thus hear either two of these long letters fairly loudly, in which case the bearing would be between them, or she would hear one long letter faintly, then one loudly, and a third faintly. This gives a rough indication of the bearing, but in order to allow of the bearings being read with a degree of accuracy sufficient for navigational purposes, the arcs between the long letters are split up by three equally spaced short letters, each of which of course will represent a half point of the compass. The letters in use are a T (one long) at the intervening points of the compass and an I (two shorts) at the intervening half points of the compass. As the beam passes over a ship the navigator would hear something of this kind—T I *L* I T I *Q* I T I.

With the receiving instrument a disc is provided marked in half points of the compass and fitted with two pegs which the observer can stick into the disc at the first and last sound which he hears, and he can then rest assured that the bearings will be midway between the points indicated by the two pegs. This gives an accuracy of bearing of a quarter of a point.

At the time of speaking one such station exists at Inchkeith Island and a second is being erected near the South Foreland lighthouse. The whole subject is still in its infancy but it is felt that the use of this great boon to navigators will extent rapidly in the near future.

At present the range at which bearings can be obtained with accuracy and certainty is about ten miles, and it has been shown that although the range of the beam may be reduced by the presence of intervening obstacles, yet there is no action tending to distort the path of the beam, and therefore this method of giving directions is not susceptible to any electrical error. Also it should be noted that this method of signalling the bearing is independent of the rate of revolution of the projector.

The absorption experienced by such very short waves is very great, so much so that it is not possible for a receiver fixed on the distant side of a ship to perceive the signals, and therefore in practice two receivers have to be fitted, one at each end of the bridge, in order to make certain that one at least of them will be operative under all conditions.

The receiver itself consists of two brass rods about a yard long fixed vertically and end to end, projecting from a small case which contains the tuning appliances. An amplifier and telephones are fitted in the chart house of the vessel, and when the navigator believes himself to be within range of revolving beam projector he switches on the amplifier and listens.

Of course there is no difficulty in joining up a loud speaker, in which case it would give audible warning should the vessel come within range of the beam. It is, of course, necessary to standardize beam transmitters, especially as to whether their bearings shall be true bearings or magnetic bearings, and also to standardize the use of the "long" Morse letters to indicate the alternate points of the compass. As the tuning is exceedingly sharp it is also necessary that it shall be permanent, and therefore it is necessary that the wave length of the beam transmitters should also be standardized.

If two beam transmitters are in operation in the same neighborhood it will be necessary to make some kind of distinction between them, and this can best be done by making use of various combinations of short letters. Thus one beam might use I T I, another I S I, another I N I, another I A I, and any of the large number of possible combinations.

Direction Finding.—It is very gratifying to note the steady improvement in the accuracy of the long range direction finders, as worked in seagoing ships. These instruments, as is well known, are intended to obtain a bearing of any vessel or coast station, making use of their ordinary wireless transmitter. Their available range is nominally 100 miles, which is about the greatest distance of real value to navigation, although accurate bearings are often obtained at three times this distance.

On account of the considerable amount of interference which exists on the wave lengths in common use among ships, the services of a really skilled telegraphist are required to operate the direction finder, and it is also highly desirable that it should be in charge of thoroughly trained men who can at once detect the fact of its going out of order, and, within reasonable limits, identify and repair any defects.

Now that the causes of error of direction finders themselves are understood and can be eliminated or compensated for, and consequently reliance can be placed upon the performance of the instrument, it has become possible to commence the search for causes external to the instrument itself which may lead to erroneous bearings. It has been well known for a long time that if the line of bearing between the receiving ship and the transmitting shore station cuts the coast line at an acute angle errors will be introduced, and by careful examination of the charts and an examination of the accuracy or otherwise of direction-finder bearings from ships in which the average accuracy has proved itself to be very high, it has begun to be possible to mark out certain arcs in which direction-finder bearings of some shore stations are liable to error. This is a complicated undertaking now only in its infancy, but it is hoped that with the co-operation of the navigating officers of ships fitted with direction finders it will be possible to add very greatly to the accuracy of the knowledge which we now possess on the subject and to the number of stations about which it is possible to lay down definitely their arcs of good and bad bearings.

It must be realized that the direction finder if mounted in a ship can only measure angles relative to the keel line of the vessel, and that before such bearings can be used for navigational purposes they must be translated into true bearings (that is to say, bearings relative to the meridian) by the navigators.

Therefore the successful use of the direction finder is almost as much dependent upon the navigating staff as upon the telegraphist, and the very successful results which are now being obtained in vessels fitted with direction finders could not possibly have been reached without the hearty co-operation which exists between the navigational staff and the wireless staff.

Telephony.—Advances in wireless telegraphy have allowed telephony to be carried out in accordance with the method which is generally called "duplex," that is to say, that it allows of transmission and reception at the same time in a fashion exactly similar to the use of the ordinary desk telephone.

There are two distinct methods whereby this can be achieved. According to one of them each station transmits on one wave and receives upon another, which differ from one another so widely that the transmitter can be arranged to have little or no effect upon the receiving instruments of the same station. This method is simple, but it is very prone both to cause and to suffer from interference, due to the fact that two very widely differing waves are employed for the purpose. A second method is to make use of two waves near to one another, so chosen that the beat frequency will be above human hearing. This method possesses many advantages, the only difficulty being that of making use of more than a very moderate amount of power.

Experiments are in hand with a view to linking up vessels within a moderate distance of their terminal ports (say fifty miles) with the local Post Office Telephone Exchange system.

There is no particular difficulty in obtaining and maintaining good telephonic speech with the wireless telephone station on land, the real complexity of the problem arising when the land telephone station has to be operated by subscribers at greatly varying distances from the exchange, as it is necessary that speech should reach the wireless telephone transmitter at some fairly definite intensity in order that distortion on the one hand and faintness on the other may be avoided. The same remark applies to the intensity of speech which must be handed over the wireless telephone receiver to the land line telephone system.

In order that the matter may be placed on an economic basis it is necessary that the land telephone apparatus should work unwatched, and the experiments now in hand are directed mainly at overcoming the troubles outlined in the above paragraphs.

At present no very ambitious scheme has been undertaken, as it is felt that the first objective is to obtain communication between a vessel say fifty miles at sea and a limited number of special subscribers at her home port. More ambitious schemes for extending the use of telephony between ships and the shore can be undertaken when the preliminary stages outlined above have been formally established.—By Commander J. A. Slee, C.B.E., R. N. (Ret.), *Engineering*, 28 September, 1923.

MISCELLANEOUS

Letters and Comment.—Captain Roy C. Smith, U. S. N. (retired), a writer and lecturer on naval science, has sent us the following comment on Professor Stevens's "Scrapping Mahan":

The very interesting and remarkably well written article in *The Yale Review* of April, 1923, by Professor William Oliver Stevens of the Naval Academy, presents a view of naval policy recently prominent, which must be taken into account in the future; that is, the regulation of armament by agreement.

The treaties formulated at the Washington Conference on the Limitation of Armament will be effective for ten years, and may be renewed. These treaties will stop competition in the building of certain naval types. It may be that other leagues, or federations, or associations of nations, or alliances, by the time the present treaties lapse, will also be effective in maintaining peace and territorial integrity, wthout the necessity of further competition in armaments.

But, in any case, does such cessation of competition really involve a schapping of Mahan? The main title of Mahan's works is "The Influence of Sea Power upon History." He shows (and before his time it was not generally recognized) that sea power had been a dominating influence in most of the great wars of the past. When he tells of England's grim ships that the Grand Army had never looked on, which, nevertheless, barred Napoleon's further advance, he brings home to all minds the gist of his argument—that sea power was a mainspring, often working silently and ununperceived, which was productive of widespread results. The principles underlying the use of sea power which he deduced historically, are, of course, immutable. Results may vary with circumstances; but in any case they are the result of causes. They follow a law, and Mahan's writings are the nearest expression of the law.

The doctrine of sea power does not seem to have suffered in the late war. The German submarines were superior for a time, because the Allies, though superior in sea power as a whole, were not able at first to contend with them successfully. Sea power made it possible to close

Germany to the world and throttle her supplies, and so contributed in a most prominent degree to the success of the war. This is the essence of Mahan's teaching.

If a nation, imbued with Mahan's teachings, strives feverishly to increase its sea power, instead of coming to an agreement with possible rivals on an existing ratio of strength, and the rivals in self-defense follow the same policy, the principles of sea power are in no wise affected. To whatever degree the ratio is limited, or if it is unlimited, one power in case of war, or several allied powers, will gain command of the sea, which is the object of sea power; and all Mahan's principles will apply with equal force, whether the armaments are great or small. It is relative strength that will decide.

There is no evidence that Mahan wrote his books to advocate winning world power by the creation of sea power. Sea power is just as necessary to maintain the position a nation has already won. What is needed in either case is the sea power that the nation's foreign policy demands. The fact that a nation strives for sea power to dominate the world cannot be a reproach to Mahan. Good tools are often used for unworthy purposes.

Professor Stevens's statement that none of the "causes that led to the World War was more potent than the expansion of the German Navy" must be a little open to doubt. The German Navy was built, of course, to meet some day that of England; but it is the very general belief that Germany did not at that time expect England to join France and Russia, which countries were her main objectives. That England went in when she did, basing her action on the violation of Belgium's neutrality, was a great blow to Germany. It was Germany's militaristic policy that brought on the war, and it was the same policy, Mahan's teachings no doubt aiding, that expanded the fleet; but it was not the expansion of the fleet in itself that brought on the war, or even in the most important measure.

With reference to the sentence which Professor Stevens quotes from Mr. C. C. Taylor's biography of Mahan, about the mental distress of the Admiral for his part in the war, I may say that to those who knew the Admiral personally, and his supersensitive nature, it was no surprise to learn that he suffered, however remote the actual connection between his teachings and the catastrophe of the World War. And in the statement immediately following, that Mahan left out of calculation the possibility of agreement and faith, consideration should be given to the circumstance that Mahan was not writing about the maintenance of peace (there is a book on the subject, of which more later), but on the influence of sea power on history. With his disposition, Mahan would have been one of the first to agree to the limitation of armament by agreement. His writings treat of one thing, this is another; the two have no connection. As long as the world keeps peace by agreement Mahan is in abeyance. When it goes to war again Mahan is revived. For the principles he elucidated resemble the law of gravity, or other natural laws; given certain situations and surroundings, they always operate.

In speaking of Mahan's contempt for nations that, having the opportunity, allowed sea power to slip, account should probably be taken of their necessity for sea power, and how much sea power was essential to support the policy of those nations. All nations do not need the most powerful Navy in the world. Mahan did not advocate that. Our representatives at the Washington Conference thought that the Treaty Navy would be sufficient for our purposes.

As to the illustration given by Professor Stevens of Norway's shipping, the reason that Norway does not need a large Navy to protect her shipping is that all the world knows that Norway is not a dominating world

power and is innocent of any intention to become one. If a dominating world power is considered, then Mahan's dictum that a large Navy is required to protect a large commerce is quite undisputed.

During the naval holiday that results from the Washington Conference there will be no increase in capital ships. Sea power consists also of other types. It is certainly the duty of all the signatories of the treaties drafted at the Conference to add such other types as may be needed to balance the capital ships under the authorized ratio. If any nation goes farther than this, that fact will be known in time. There are only two remedies—another conference, to limit all types, or competitive building of types not limited. The former is of course simply an extension of the present limitation; the latter reverts to the disastrous practice of the past.

Peace by other means than war has been very fully treated in a book, to which allusion has already been made, by Colonel S. C. Vestal, U. S. Army, entitled *Maintenance of Peace,* published in 1920. It should be read and pondered by every person interested in our foreign relations. A striking point brought out by Colonel Vestal is that it has frequently happened in history that a nation has excelled either in its Army, or in its fleets, according to its needs; but the instances are rare when it has excelled in both. And, that when a nation is striving to excel in both, that nation will bear watching; its object is probably world conquest.

It appears that there are two separate questions under discussion in Professor Stevens's article—one the doctrine of sea power in its bearing on warfare, the other the maintenance of peace. The Washington Conference adopted some of the recognized methods of maintaining peace; and if in the discussions Mahan was not mentioned, it must be that in the view of the participants his doctrine was not involved.

The argument sustaining the title of the article may possibly be expressed briefly as follows: Mahan elucidated the doctrine of sea power. Ships are the basis of sea power. The Washington Conference scrapped ships. The Washington Conference scrapped Mahan. This is an interesting syllogism—whether or not it is a *non sequitur* may be left to logicians.

Leaving out the question of "scrapping Mahan," the remainder of the article, which takes up our duties with regard to the Navy under the treaty, and our future naval policy, is altogether thoughtful and commendable. With a different title and some changes in the text, little exception could be taken to the article. It is, however, a pity that the public should gain the idea that any doubt has been cast on Mahan, who is not only our greatest naval writer, but who has given a doctrine to the world that is practically impervious to attack.—*The Yale Review,* October, 1923.

EUROPE'S POLITICIANS ARE CALLED INSINCERE.—London, October 4.—Sincerity is the virtue which appears to be prized above all others by the peoples of the Orient. When Chinese or Japanese say of a man "He is sincere," or "He is insincere," the phrase implies a great deal more than it would do in the Occident.

Not that Eastern folk, individually or in the mass, are more addicted to sincerity than those of the West: it is simply that to them a sincere man is more admirable than a good man— "good"; that is, according to our Western interpretation of the term. Mr. Ozaki Yukio, the spokesman of Japanese liberalism, said in a recent speech that "the political troubles of the world have their root in insincerity." And was he not right?

At this very moment half a dozen flagrant examples of insincerity in the political world can be cited. Take the outstanding problem of the day, that of reparations. Can anyone say positively what France, or Germany, or even England, is aiming at? Recent events have cast doubt on the sincerity of their official explanations.

Does France merely wish to collect her indemnity, or is she working to bring about the disintegration of the German Empire? Does Germany honestly mean to pay up to her full capacity, or is the latest "crisis" yet another trick to postpone the day of reckoning? Is the bulk of the nation still attached to the republic, or does it still hanker after Kaiserdom, and is Prussian militarism as extinct as we have been led to believe?

And where does Britain stand in this quarrel? How are the two British notes that denounced the Ruhr occupation as illegal and threatened to institute separate negotiations with Berlin to be reconciled with the recent London Foreign Office *communiqué*, which laid emphasis on the substantial agreement existing between British and French policy? Nothing whatever had occurred in the interim to account for this sudden change of front.

At the present time a section of the British press is deeply concerned at the possibility of the German Empire going to pieces. Such an event, we are warned, would have the gravest consequences to Europe, and would, in particular react disastrously on British trade.

Those who write in this strain lay themselves open to the charge of insincerity. To approach the matter quite impartially, why should the collapse of Britain's chief commercial rival in Europe be so detrimental to British trade. In normal times we purchased far more from Germany than she from us, which means that the British market was much more lucrative to her than the German market was to us. If Germany were permanently down and out, there is every reason to believe that British trade would flourish as never before.

Conversely, if she regains her economic stability she will at once become our most dangerous competitor, underselling our manufactures in the home and oversea markets and depriving countless British workers of employment by flooding this free-trade country with cheap goods. Even today the pressure of German competition is being severely felt and is undoubtedly responsible for a great deal of unemployment now prevailing.

From the political point of view the break-up of the German Empire might have serious results to the world at large, but even here there is palpable insincerity in the jeremiads to which we are being treated by German sympathizers.

It was not until Germany had achieved unity that she became a menace to the peace of Europe. So long as the empire holds together the chief executive power will remain vested in Prussia, and Prussia for centuries has been dominated by the military tradition. It was entirely at her inspiration that the newly born German Empire became an armed camp; the virus of Prussian militarism soon contaminated the normally peace-loving Saxons and Bavarians and made them willing instruments of her warlike ambitions.

Only a few weeks before he was butchered by Prussian Nationalists Dr. Walter Rathenau had inveighed against the Prussianization of the Germanic race since the establishment of the empire: "The Prussian officers and officials, cool and conscious of their strength, avoided declamation and interfered only when their interests were endangered. The great industrialists sold themselves. The higher stratum of the middle classes took the business seriously and created that atmosphere of hatred of Socialists, telegrams of homage and megalomania which made us intellectually and morally impossible before the world. Instead of the Germany of thought and spirit, one saw suddenly a brutal, stupid community, greedy for power, who had no ideas beyond rancor, and who, with these properties which they were pleased to call Kulture, undertook to bring blessing to the world."

Let there be no mistake about it: If the German Empire survives it will be only a question of time before Prussia regains all her old ascend-

ency. And is there an atom of proof that she has renounced her traditional aims and ideals? The dissolution of the Reich would, indeed, offer the surest guarantee of peace if it were certain that no other claimant to the military hegemony of Europe would arise.

But there, of course, is the rub. It is because they wish to see Germany remain strong enough to act as a counterweight to France that certain British statesmen are so hostile to M. Poincaré's supposed plan of reducing Germany to a congeries of autonomous states. It would be more honest to own up to this motive instead of uttering insincere platitudes about the German people's right to self-determination.

What they are really concerned for is the balance of power, once condemned as a standing incitement to war, now almost universally recognized as an essential bulwark of peace.

If the issue were put squarely before the average Briton, he would probably elect to back France, not because he has any particular love for that country, but because he believes she would be less dangerous, even though armed to the teeth, than a Germany reconstructed and reorganized on pre-war lines. You simply cannot make his flesh creep by dilating on the size of the French Army and references to the overpowering strength of the French air fleet or to the growing number of French submarines leave him equally unmoved.

It is not that he underrates the military prowess of his Gallic neighbors: far from it. Hundreds of years of almost incessant warfare with France on land and sea have given the British a clearer appreciation of her martial qualities than any other nation can possess. As an enemy the Frenchman does not unduly alarm the Briton, who always feels that this is a foe whom he can understand, who fights and even ferociously, but who usually "plays the game" and observes a certain decency in his combatant methods.

But the German he puts in quite another class. What impressed the British during the late war was not so much the stark military efficiency of the German as his sublime disregard of all the accepted canons and conventions of "civilized" warfare. That is, no doubt, an old story now, but the memory of German "frightfulness" in every sphere and of the cynical unmorality displayed by German leaders and statesmen during those four years of war will not easily fade from the British mind.

Little malice is cherished against the late enemy, but there is a deep-rooted suspicion of his good faith. It is felt that the German, or rather the Prussian, is constitutionally incapable of giving a square deal according to Anglo-Saxon ideas because he sees things from a different angle of mental vision.

"Does it not seem," asked a well-known writer some years ago, "that nothing is to the Germans as it is to us; that black may veritably be white to them; that the scent of roses may be foul and the odor of sewers like perfumes of the East; that nectar and ambrosia may for them be food for swine and the sunshine of spring a glow meant only for depression and discouragement?"

One is tempted to speculate on what might happen if the world's statesmen were suddenly to discard equivocation and make a clean breast of their respective aims. Perhaps the results would be more mischievous than those which have already ensued from the practice of insincerity and prevarication.

When the Græco-Italian dispute came before the League of Nations last month Lord Robert Cecil made a passionate appeal to his fellow-delegates to be courageous and sincere in their treatment of this crucial test case. Had his advice been taken the league must have condemned Italy and threatened her with the pains and penalties prescribed for a breach of its covenant.

Italy, of course, would have flouted this verdict, withdrawn herself

from the league and proceeded to take what she wanted from Greece by force of arms. The sequel would have been a conflagration in the Balkans, with infinite possibilities of tragic development.

Again, if M. Poincaré were frankly to avow his purpose of smashing the German Empire to fragments, the Entente would automatically collapse, leaving France and Britain in open antagonism. On the whole, therefore, insincerity may not be an unmitigated evil in diplomacy, though the plain man is left wondering why the straightforward dealing that alone makes business transactions possible and social life tolerable should seemingly be fraught with disaster when applied to intercourse between governments.—By Hector C. Bywater, *Baltimore Sun*, 19 October, 1923.

Postponement of Dutch Navy Bill.—Contrary to a decision announced some few weeks ago, the Dutch Navy Bill is not to be submitted to Parliament in the immediate future. It had been proposed that this measure, which aims at strengthening the naval forces, especially in the Dutch East Indies, and developing new bases and fortifications there, should go before the legislative bodies without further delay, owing to its vital bearing on the security of the valuable colonies in the East. While considerable opposition was anticipated, the Government fully expected that Parliamentary sanction would be obtained for the bulk of the shipbuilding program, which consists mainly of submarines. Last week, however, it was reported that the financial stringency in Holland and in the Dutch Indies had decided the Government to postpone the introduction of the Bill until next year. This decision is perhaps not unconnected with the earthquake catastrophe in Japan and the retarding effect it will presumably have on Japanese naval expansion. The object of the Bill was to create an East Indian marine which, without being powerful enough to deter attack by a first-class navy, would be sufficiently strong to hold such an enemy at bay for a certain period, thus rendering possible the timely intervention of some other great Power which had an interest in maintaining the integrity of these Dutch possessions. The growing dimensions of the Japanese Navy in recent years, even since the Washington Conference, had caused disquietude in Holland, where it was held that the limitation treaty, so far from having reduced the danger to the Dutch Indies, had increased it by eliminating European and American Pacific bases, and thus confirming Japanese supremacy in Eastern waters. It must be confessed, however, that Japan has never given evidence of cherishing any aggressive designs on these territories, which contribute so much to the prosperity of the Netherlands.—*Naval and Military Record*, 3 October, 1923.

Effects of War on International Law.—Professor Nippold, a well-known writer upon international relations, is a German by birth, but a citizen of Switzerland, Professor James Brown Scott, Director of the Division of International law of the Carnegie Endowment for International Peace, says in an introductory note that for the last twenty years "nobody has been more interested than the author of this book in the creation of an international law which shall meet the needs of the world and be developed in accordance with the principles of justice which either are or should be universally accepted," and that his aim has been to bring German conceptions of international law into an approximate relation with the conceptions obtaining in his adopted country and in countries where the development of international law is less closely connected with patriotic ambitions and political projects.

The book was originally intended to be the closing chapter of a larger work on international law in the late war. Two parts of that larger work were published in 1920. The present book was published during the war and sets forth the author's views of the needs of the world in the way of organization to prevent future wars.

In his introduction the author clears the ground by pointing out that law and war are antagonistic and therefore that the latter is really outside the sphere of law. To quote the author's words:

"The science of international law has hitherto apparently gone rather too far in the treatment of the war problem. In the endeavor to interpret war also from a legal standpoint as far as possible, the doctrine has deemed it necessary to invest war with the character of a legal institution, and the doctrinal discussions about war have often strayed far from reality. These theorists overlooked the fact that law will never entirely encompass war and can never regulate it in all its relations; and this for the simple reason that war itself is already a negation of law, and because in the waging of war it is not legal considerations but the necessities of warfare that are the impelling motives. It would have been far better if the doctrine had in general simply adhered to facts. It is a fact that war is not a legal institution, but simply the application of force. War is struggle, employment of force, and in so far as it is to serve the enforcement of claims it is self-help. This is the definition military science gives of war, and with this the science of international law should have contented itself, for from this definition of war it already appears that war, considered as a whole, is outside the sphere of law" (p. 7).

Admitting that the modern law of warfare has been codified, the author differentiates the law of warfare from international law and points out that to conjoin them can "only have the result that the discredit which attaches to law of warfare will also be carried over to the normal international law. There is only one means of avoiding such discrediting, to which the present war bears all too eloquent testimony, and that is the clearest possible distinction between international law and the law of war."

Reviewing the halting endeavors before the beginning of the late war to effect adjustment of controversies among nations, the author argues that the most essential tasks which will confront the development of international law after the war will be in the province of international procedure; a subject to which the author in a well-known work published in 1907, had devoted much attention. Three kinds of procedure in international disputes have been recognized and used: mediation, commissions of inquiry and arbitration. Mediation and commissions of inquiry imposed no obligation and provisions for arbitration failed of effect because arbitration was not obligatory. The problem is how to obtain guarantees for the use of arbitral procedure. Professor Nippold argues (and it must be remembered that this book was published in German during the flagrancy of the war), for "a league of States or something of that type." Quoting from an earlier work of his own, the author finds inspiration in the history of international law and particularly in cases settled by arbitration, showing that never yet has a State unlawfully refused to accept the arbitral award; but he is compelled to acknowledge that the experiences of the late war have to a certain extent shaken this faith.

The war has brought us fact to face with the relentless fact that international treaties have been broken. On the occasion of the violation of the neutrality of Belgium such a treaty was even described as a "scrap of paper." This occurrence is fortunately without precedent in the history of international law and it is to be hoped that it will remain the only one of its kind. But faith in the moral power of international law has thereby suffered a shock from which the civilized world will not very quickly recover. This enables us to understand why today the call for more real sanctions for the international legal order has been heard on every hand.

The author believes that by way of reaction against the contempt for international law which came to light in the late war, "and for which the press is largely to blame" (!), after the war will presumably come a great increase of appreciation of international law.

The need, however, is for guarantees which will partake of the character of real sanctions.

For the basis of international law has hitherto been confidence, and unfortunately there can be no doubt that at the present time this confidence is lacking. But where confidence is lacking, international law can only be founded upon compulsion. This is the sad result of this war.

The means of this sanction and the application of this compulsion are to be found in a League of Nations of which it shall be a fundamental principle that all international disputes among its members be submitted to an international procédure. Therefore, only such States can become members as will pledge themselves (a) to lay all disputes in which they participate before an International Court of Arbitration, unless those disputes clearly concern their actual vital interests; (b) to submit those disputes which clearly concern their actual vital interests to mediation or an investigating commission. If a member of the League should resort to war, it should be expelled from the League, whose members would break off diplomatic relations with the recalcitrant nation, and, if the latter should persist, the League should then resort to economic pressure, and, if that should fail, to military coercion. Professor Nippold elaborates these views in fourteen points.

As Professor Scott has said in his introductory note:

"This little book is therefore to all practical intents and purposes a commentary on the League of Nations before its birth."

In a fine passage the author says:

"The idea that the world of States shall submit to a legal order with equal rights for all may be called a democratic one. At any rate, the democratic form of government is the one under which the realization of this idea will find the least obstacles. Whereas the idea of might finds expression in militarism and imperialism, the idea of right—the idea that right in the life of nations shall prevail over might—beyond a doubt finds its adequate expression above all in a democracy. . . . The future of the world does not belong to the powers of militarism and imperialism, which are hostile to international law, but it belongs to democracy."

The people of the United States were abominably deceived in the partisan and insincere attacks made upon the proposed League of Nations before and during the campaign of 1920. There is much reason to believe that they have begun to discover the deception and the base motives that instigated the opposition. To what extent the truth has permeated the minds of the people no one can with confidence say, but that the truth will prevail and the fine idealism and practical good sense of former President Wilson in his advocacy of the League of Nations become an inspiration and a spring of action we do not doubt.

President Harding's halting advocacy of an international court, with impossible conditions, will, we believe, be rejected, and our whole-hearted acceptance of and entrance into the League of Nations do something to obliterate a discreditable page of our history.—A Review by Abraham Benedict in *New York Times*, 30 September, 1923.

CURRENT NAVAL AND PROFESSIONAL PAPERS AND ARTICLES

"The Gas Turbine and Marine Propulsion."—*The Marine Engineer and Naval Architect*, September, 1923.

"Pouring and Fitting Babbitt Linings."—By A. Hoyt Levy, *Power*, 25 September, 1923.

"Accurate Methods of Aligning Steam Turbines—Using Sound to Increase Sensitiveness of Measurements."—Edgar G. Backer, Sr., *Power*, 2 October, 1923.

"Steam Trap Installation and Operation."—R. N. Robertson, *Power*, 9 October, 1923.

"Correcting Vibration in Reaction Type Turbines."—L. Long, *Power*, 16 October, 1923.

"Artillery Design."—Brigadier General Golden L. H. Ruggles, *Army Ordnance*, September-October, 1923.

"Examination of Steel by the X-Ray Spectrometer."—Hermann H. Zornig, *Army Ordnance*, September-October, 1923.

NOTES ON INTERNATIONAL AFFAIRS

PREPARED BY

ALLAN WESTCOTT, PROFESSOR, U. S. NAVAL ACADEMY

FROM SEPTEMBER 23 TO OCTOBER 23

GERMANY AND REPARATIONS

FREE HAND TO STRESEMANN.—On September 27, following defiance of the Federal authorities and establishment of military rule in Bavaria, the Stresemann Federal cabinet met in extraordinary session, declared a state of emergency throughout Germany, and proclaimed that executive authority was granted to Minister of Defense Gessler to put into force any military or police orders warranted in the circumstances. The action was intended as a precautionary measure against the threatening situations both in reactionary Bavaria and communist Saxony and Thuringia.

Following desertion by the Socialist Party the Stresemann Cabinet resigned on October 3 but was at once reconstructed.

On October 13 the Reichstag by a vote of 316 to twenty-four approved the Extraordinary Powers Bill, granting to the government power to promulgate orders and decrees without parliamentary approval. Thus the Reich passed under a system of modified civil and military dictatorship.

BAVARIA DEFIES REICH.—After the Federal Government's abandonment of resistance in the Ruhr, and as a result of anti-communist and pro-royalist agitation, the reactionary government in Bavaria on September 26 declared a state of martial law throughout the country and appointed former Premier Von Kahr General Commissioner of State with dictatorial powers. The Federal Military representative in Bavaria, General Von Gossow, sided with the Bavarian Government and refused to carry out orders from Berlin. Upon his removal by President Ebert, the Bavarian dictator appointed him Commander-in-Chief of the Bavarian Reichswehr in open defiance of the Federal Government. This the Berlin Government declared to be an open breach of the Federal Constitution.

It is obvious that there are only two alternatives before the Reich Government; one is negotiation with Bavaria, the other, resort to force, thus letting loose the horrors of civil war. And it is certain that Berlin will move heaven and earth to avoid the latter alternative.

The Government today issued a proclamation to the German people, warning them against what is termed Bavaria's open breach of the Constitution. The proclamation declares that Bavaria has thought fit to bring

about internal disputes in the Reich, despite the intolerable distress in the Rhineland and the Ruhr, and that the question is whether military discipline is to prevail.

The action of the Bavarian Government at a time when the Imperial Government requires the forces of the whole of the people in order to hold out against the French "annihilatory policy," is strongly condemned by the proclamation, and an appeal is made to all Germans to combine in the struggle "for the only thing that remains to the German people—the German Reich and German unity."—*New York Times*, 19 October, 1923.

COMMUNIST RULE IN SAXONY.—The Socialist-Communist Governments in Saxony and Thuringia, in retaliation against the reactionary trend in Bavaria, added Communist agitators to their cabinets, sanctioned "red" military organizations, and by so doing came in conflict with the Federal Government.

In Saxony the Federal Government supported General Von Mueller, Federal Military representative, in his conflict with the "Soviet" Saxon Ministry, sending troops into the country and telling him to maintain constitutional law and order.

On October 18 Bavaria and Saxony severed diplomatic relations, Bavaria declining to receive a Saxon representative so long as the Communist party was represented in the Saxon Ministry.

This conflict between red Saxony and reactionary Bavaria, and the defiance of the Reich by both, heightened the difficulties of the feeble Federal Government in its efforts to deal with Germany's external problems.

RHINELAND REPUBLIC PROCLAIMED.—Taking advantage of the weakness of the Reich as revealed in its conflict with Bavaria, Separatist agitators in the Rhineland on October 21 seized the public buildings in Aix-la-Chapelle, in the Belgian zone of occupation, and proclaimed a Rhineland Republic. An armed force said to number about 3,000 occupied the city. The extent of French or Belgian support for this movement was not clear. It was declared to be the intention of the Separatists to push for control throughout the western part of the occupied territory.

FRANCE AND REPARATIONS.—Following the abandonment of passive opposition in the Ruhr, the German Government approached France and Belgium in an effort to reopen negotiations on the Ruhr and reparations problems. These efforts were rebuffed by the Allies, Premier Poincaré declaring that until Berlin consented to continue payment of deliveries in kind and in general restored conditions as they were on January 11 prior to the ocupation, no German proposals could be considered.

GERMAN APPEAL TO ALLIED POWERS.—Berlin, October 20.—Attempts to reach an understanding with France that would permit work in the Ruhr to go on and bring some settlement of the reparations problem having failed, the German Cabinet decided this afternoon to send a circular note to all the Allied powers demanding intervention in the Ruhr.

The note will be in the form of a memorandum, calling the attention of the allied powers to the efforts of Germany to find a solution of the

problem, to the fact that the passive resistance was given up in the hope that France would consent to negotiate, to the demands of France for virtual control of all of Germany's railway outlets abroad through direction by the French of the Wesel-Emmerich and Frankfort-Basle line, and to the refusal to permit German civil officials to return to the occupied area.

The offers and suggestions made by Chancellor Stresemann since taking the post of Chancellor are also outlined and the internal situation of Germany is discussed with utmost frankness. The note declares that France has taken an untenable position, which is greatly against the common interests of the Allies and is leading to the utter destruction of Germany. The note calls for Allied intervention in the name of humanity for the salvation of Germany and Central Europe.—*New York Times*, 21 October, 1923.

FRANCE

ALLIANCE WITH CZECHOSLOVAKIA.—Paris, October 20.—Before leaving France, President Masaryk and Foreign Minister Benes of Czechoslovakia accepted in principle the making with France of a series of accords, commercial, political and military, which would amount to virtually an alliance. Only the groundwork of this alliance has been laid, but the French expect it to work out into an arrangement similar to that between France and Poland.

That Paris and Prague see fit at this time to enter into another arrangement makes it certain that the arrangement will be closer and more important than the relation between France and the Little Entente, of which Czechoslovakia is a member. As the foster parent of the Little Entente, of which Benes is the pillar, France has been followed in her general foreign policies by Prague. There is no serious political difference between the two countries, and in the political accord to be written there will be rather an alignment of respective privileges and duties.

The political effect of an alliance between France and Czechoslovakia will be most important. With Belgium and France on the west, with Poland on the east and with Czechoslovakia on the south, Germany will be almost entirely surrounded by a cordon of great armies, all virtually commanded from the French capital—on the west the Belgian Army of a million, on the east a Polish Army of 400,000, to the south a Czechoslovak Army of almost 300,000.

A glance at the map with the end of Czechoslovakia sticking into Germany toward Berlin shows the importance of the French command of the Czech Army in the event of Germany's making a move at Poland.

From a larger political point of view the Belgian-French-Czech-Polish alignment forms a combination which bids fair to dominate Europe, regardless of any other combination which could be made unless the Russian military machine could be brought to a degree of offensive efficiency which the French do not believe to be possible. It would seem difficult to construct any balance of power against the French. In addition to alliances with Poland and the Czechs the French have arrangements with Rumania and Jugoslavia which would assure passive if not active support of those countries in almost any eventuality.

Would not this combination be stronger in Continental affairs than a grouping of England, Germany and Italy? That leaves out Russia, and in passing let it be noted that there is now going on in high French circles a debate as to the attitude France should adopt toward Russia and in that debate the party headed by the French Premier is not the party most adversely disposed toward Russia and the Soviets.—*New York Times*, 21 October, 1923.

GREAT BRITAIN

IMPERIAL CONFERENCE OF PREMIERS.—The British Imperial Conference was opened on October 1 by Premier Baldwin, who emphasized in his address the need of economic co-operation among all parts of the empire for mutual welfare. Ireland was represented for the first time by President Cosgrave and Mr. Fitzgerald. At the same time as the Premier's Conference, an Imperial Economic Conference was in session in London, for consideration of co-operation in the use of diplomatic, commercial and consular services; statistics regarding empire trade; co-operation in regard to patents, designs, and trade-marks; valuation of goods for customs duty; and similar commercial questions. In later sessions the Economic Conference took up a plan suggested by Premier Bruce of Australia for a purchasing pool for empire food and raw materials. The British Government announced a policy of extending credits to smaller colonies to accelerate their development, also a policy of preference to colonies and dominions in the award of public contracts, and extension of the present policy of preferential tariffs on certain commodities produced in British dominions, including sugar, tobacco, and fruits.

LEAGUE OF NATIONS

ADMISSION OF NEW MEMBERS.—During the session of the League Assembly at Geneva in September, Ireland and Abyssinia were admitted as new members, the latter on a pledge to abolish slave trade. A resolution interpreting Article X, so as to limit the obligations of member states in the enforcement of league decisions, was defeated by the single vote of Persia. Twenty-nine states voted for the resolution and thirteen abstained from voting. The rules of the Assembly require that interpretation resolutions shall be unanimously adopted, although amendments require only a two-thirds majority. It was evident that several of the smaller states objected to a weakening of the protective force of the article.

ITALY AND NEAR EAST

ITALY AND GREECE.—In accordance with the proposals of the Council of Ambassadors, Italy evacuated Corfu on September 27. The indemnity of 50,000,000 lire ($2,160,000), which Greece had deposited in the Swiss National Bank, was awarded to Italy, in spite of the protests of Greece.

AGREEMENT OVER FIUME.—Rome, September 24.—It is authoritatively confirmed that an agreement on the Fiume issue has practically been reached between Rome and Belgrade and will shortly be announced on the following basis:

First, Fiume passes under Italian sovereignty; second, the delta and Porto Barros pass under Yugoslavian sovereignty; third, Yugosalvia obtains a rectification of the frontier to the north of Fiume, which will put a few small villages under her sovereignty; fourth, Yugoslavia and Italy will respectively run Porto Barros and the harbor of Fiume for themselves, but all goods on their way to Yugoslavia will be allowed to pass duty free through the Fiume harbor.

The New York *Times* correspondent learns that negotiations for the stipulations of a commercial treaty between Italy and Yugoslavia are also far advanced, and that there never has been any question of Italy trying to induce Yugoslavia to bind herself not to have a war fleet in the Adriatic, as has been stated in some quarters.

Negotiations for a political and military alliance between the two countries have temporarily been abandoned, owing chiefly to the fact that public opinion in Yugoslavia is not ready for such a step, but the negotiations may be resumed at any moment as soon as conditions are favorable. It is rumored also that the Little Entente looked with small favor upon the prospect of a military alliance between Italy and Yugoslavia.—*New York Times*, 25 September, 1923.

ALLIED EVACUATION OF CONSTANTINOPLE.—Constantinople, October 2 (Associated Press).—The Allied occupation of Constantinople, formally ended at noon today. For weeks transports have been evacuating troops and material, while one by one the warships have slipped away, thus making today's function merely a brief military ceremony that lasted about half an hour.

One cruiser and two destroyers of each power will remain until December. There was no official American participation in today's ceremonies; even the destroyer flotilla had purposely disappeared from its customary anchorage and had dispersed to distant stations.

Washington, October 2.—According to information given at the State Department today, the old station ship *Scarpion* and one supply ship will be retained at Constantinople, but no other Amercian naval units will be kept at that port or in the Sea of Marmora. The destroyers will not be withdrawn at this time, but kept in other Turkish waters.

An official said this decision had been reached voluntarily by this Government and that no protest had come from the Turkish Government against the presence of American warships in Turkish waters.

WORK TO BEGIN ON CHESTER CONCESSION.—Constantinople, October 14.—The Turkish authorities have declined to assent to the request of Colonel E. Clayton-Kennedy, representing the Ottoman-American Development Company, for an extension of the time limit in taking up the option on the Chester concession.

Colonel Kennedy therefore has declared his readiness to begin work on the stipulated date, November 9, on the Samsun-Sivas Railway.

The so-called Chester concession in Anatolia was ratified by the Turkish Parliament last year as the conclusion of negotiations begun in 1898 by Rear Admiral Colby M. Chester, retired, and revived by his son, Arthur Chester, in 1909. When announcement was made that the right had been granted to the Chesters to undertake extensive oil and railway projects in Turkey, there were protests by the British and French Governments, each of which claimed prior rights. However, the American State Department denied responsibility and the Lausanne Treaty of last July virtually reaffirmed the Americans' rights.

There ensued a vigorous dispute between the Chesters and Colonel Clayton-Kennedy, a dispute that had the effect, among others, of halting the financing of the $2,000,000,000 projects in Asia Minor. This dispute was submitted to arbitration, Colonel Clayton-Kennedy meanwhile having been denounced as a spy by the younger Chester, having been arrested in Turkey and having obtained his release when General Goethal, then associated with the Chesters, refused to back the son in his charges against the Canadian Colonel.

Last August the arbitrators decided that the Clayton-Kennedy group must pay to Admiral Chester and his associates $300,000 in cash and allow

them ten per cent of any profits on the Turkish venture. In return the new group got full control of the Ottoman-American Development Company and its subsidiaries.

UNITED STATES AND LATIN AMERICA

PHILIPPINE OPPOSITION TO GOVERNOR GENERAL WOOD.—Encouraged by a coalitionist victory in the recent Philippine election, leaders of that party in the insular legislature on October 8 declared for a policy of non-co-operation with the Governor General and refusal to pass measures recommended. On October 17, the legislature after a stormy session passed a resolution approving the action of the Independence Commission of last July in petitioning for Governor Wood's recall.

The support of the Washington administration was conveyed to Governor General Wood in a cable message from Secretary of War Weeks reading in part as follows:

"After personal conference with the President, and recognizing the necessity of bringing about co-operation between the branches of the Philippine Government, executive, legislative and judicial, and maintaining the clear line of demarkation between them which is essential to well-balanced government, it seems well to make the following authoritative statement of the views of the Administration here.

"The personal sacrifice involved in your acceptance of your present office is proof of your desire to serve the Filipino people as you have served the United States. You are entitled to the support of the Administration, and you have it.

"The controversy with the legislative leaders and certain executive officers is at bottom a legal one. The Congress, after full consideration, vested the authority of control and supervision over all departments and bureaus in the Governor General, which makes these officials directly responsible to him and not to the Legislature as in a parliamentary form of government.

"The powers of the Governor General have not been exceeded or misused by you in any instance of which the War Department is advised. If the Legislature has enacted legislation violative of the provisions of the organic law, such legislation is to that extent null and void, and in so far as it provides for encroachments on the authority of the Governor General is in no way binding on that official.

"The Legislature has in a number of instances delegated legislative power in violation of the principles of constitutional government. Silence of Congress on such legislation does not effect a modification or amendment of the organic law.

"The veto power granted to the Governor General is applicable to all legislation, whether it be local or otherwise.

"The Legislature has provided for the establishment of a bank and for certain investments of a business or semi-business character. This was within the authority of the Legislature. In agreement with this Administration you believed these investments unwise and have advised the Legislature accordingly. This was your duty. Certain officials connected with the bank were corrupt. You have brought them to trial. Your duty in the premises has been fulfilled.

"The Legislature must now determine whether these Government enterprises are to be carried on or not. So long as the Legislature indicates through adequate legislative enactment and provision of necessary means its desire and purpose to carry them on you should endeavor to have it done efficiently.

"If the foregoing offers a basis upon which the co-operation contemplated by the law can be assured in the Philippines, it will be supported here."

ARGENTINE AND BRAZILIAN RIVALRY.—Everyone in Argentina and Brazil, without distinction as to creed or political color, agrees that there are no pending conflicts to be settled between the two countries; that there are no boundary lines yet to be defined; that neither of them is in need of territorial expansion; that there is no commercial competition; and finally, that there is no tradition of war hatred fanning a national aversion or dislike. Yet the fact remains that today there is being instilled into the hearts of the two peoples the poison of doubt, jealousy and suspicion; and that a policy of armed peace seems likely to be adopted by Argentina and Brazil, laying the foundation for a future war.

That the United States should not hold itself aloof from this incipient conflict, that it has a certain responsibility for its present acuteness; and that likewise it has in its hands, and legitimately, the power and sufficient moral authority to avert it, or to stop its further development is undeniable and soon will be seen.

A few hours before President Pessoa of Brazil received the Ambassadors from almost every nation of the world, on the occasion of Brazil's Centennial in September of last year, he signed a decree authorizing the fortification of over ten ports, the purchase of warships, submarines, and the like, together with war material for the army on a scale heretofore unknown in the South Atlantic.

The significance of this gesture and its inopportunity were lost amid the din of the hosannas and the pro-peace speech making of the occasion.

But when the exhilaration and the diplomatic raptures of the first moments were over, and when a training commission formed of able men of the American Navy arrived in Rio at the invitation of Brazil and the Itimarty Government instructed its representatives at Washington and Santiago to the effect that the problem of reduction of Armament (its discussion had been suggested by Chile) should be "taboo" from the program of the impending fifth Pan-American Conference, restlessness began to grow in Argentina and Brazil. . . .

Under normal conditions, the arrival of such a military mission in Brazil would not have been a cause of interest in Argentina. Argentina, like Brazil itself and other countries, has in the past engaged military missions from Europe, and such events were never felt to be a particular reason for concern by any of the neighboring countries.

But coupled with the arrival of the mission in Brazil were the recollections of the intransigent attitude of Brazil in the discussions of the Disarmament Committee of the League over which M. Viviani presided, the signing by President Pessoa of a bill providing for the formidable increase of the naval and coast defenses, and the reluctance of Brazil to accept Chile's proposal that the disarmament question be included in the program of the Santiago Conference. The impression made in Argentina by this last event cannot be wondered at.

In this connection the charge that the United States is playing up to Brazil's game of qualifying to share the United States' hegemony in America should not be treated lightly. The idea may appear preposterous to some; but it would be unwise to ignore its existence in the minds of the Brazilians, and what we say in endeavoring to reproduce Brazil's point of view is certainly not the product of the imagination.

However, it is up to the United States to decide whether the game is worth the candle. In so doing it will be well to remember that nothing will go further toward strengthening the budding Latin-American Union, which has been built on the basis of antagonism toward the United States and in opposition to Pan-Americanism as its policy, than playing favorites.

Argentina does not need privileges of preferential treatment to fufill its manifest destiny. Argentina needs only peace and freedom from con-

cern in respect to foreign problems. If such an international situation is secured, within twenty-five years Argentina will have a population of over 30,000,000; and having reached by then the industrial cycle of its evolution, a cycle approached by the United States only forty years ago, it will then have no external problems to contend with. It is here and at this juncture that the moral authority and the undeniable influence of the United States can and should be used to advantage; namely, as a guarantor that the peace of America will not be disturbed.—Enrique Gil in *Our World* (October).

FAR EAST

TSAO KUN ELECTED PRESIDENT.—Tsao Kun, the new President of the Chinese Republic, assumed office in Peking in the middle of October and was recognized by foreign powers. His election was repudiated by seventy-four members of the Parliament from Southern China, and a bulletin was issued by Sun Yat Sen at Canton declaring the election an act of usurpation and treason.

On October 15 China made a more satisfactory reply to the demands of the powers regarding the Lincheng outrages, accepting the demands in principle and leaving details for further discussion.

REVIEW OF BOOKS

ALFRED YARROW, HIS LIFE AND WORK, by Eleanor C. Barnes (Lady Yarrow), Longmans, Green and Company, New York, $3.50.

The fact that Alfred Yarrow invented the Yarrow Boiler introduces sufficiently well the subject of this book. The safe attainment of high steam pressures which Yarrow's work made possible led to wonderful results in speed and efficiency in marine propulsion. The life of Yarrow was intimately connected with the history of speed in ships practically since 1868, and the author in tracing Yarrow's career has detailed the successive stages in the race for speed.

It is to be regretted that Yarrow could not have been induced to take an active part in the writing of the book. For a long time he was opposed to the publication of the book and consented only very reluctantly, even then without having read all of it. The career of Yarrow lacking as it did spectacular aspects forces the author to resort at times to vague generalities. His most important single achievement, the development of the Yarrow boiler, is dismissed in the book by the statement: "Many years and much money were spent in making tests before the Yarrow Boiler assumed its final form and proportion." As a reader I feel that it would be interesting and to me as student of marine engineering I feel it would be inspiring to know the nature of the early tests, the results of the trials, the accounts of the partial successes and the reasons for changes.

Yarrow continued to take a personal interest in all the boats turned over by his firm to the British Navy. Letters, personal visits, and gifts to the crews were the means by which he showed his pride in "Yarrow Boats." Besides the genuine pleasure this afforded him it is not improbable that it resulted in many helpful suggestions being brought to him which when feasible were incorporated in later vessels.

To the officers of our Navy who during the war were thrown in company with Yarrow boats the book will prove interesting in supplying a character study of the man after having seen the results of his useful lifework.

W. E. F.

MINUTES OF ANNUAL MEETING, 1923

In accordance with Article V, Section 1, of the Constitution and By-Laws, the annual meeting was called at 8:05 P. M., on October 12, 1923, in the Board room of the Officers' Mess, U. S. Naval Academy.

Captain R. M. Watt (CC), U. S. N., senior member of the Board of Control, present, presided.

The reading of the minutes of the last annual meeting was dispensed with, they having already been published in the PROCEEDINGS.

The first stated business being the election of officers, the previously appointed tellers submitted report of the voting as follows:

For President:

Rear Admiral W. L. Rodgers, U.S.N.....683
Scattering 24

For Vice-president:

Rear Admiral H. B. Wilson, U.S.N.....660
Scattering 30

For Secretary and Treasurer:

Commander H. G. S. Wallace, U.S.N.....549
Lieutenant Commander H. B. Hird, U.S.N.....155
Scattering 2

For members of Board of Control:

1. Commander John Downes, U.S.N.....623
2. Brigadier General George Richards, U.S.M.C.....573
3. Captain R. M. Watt (CC), U.S.N.....559
4. Commander W. R. Van Auken, U.S.N.....556
5. Captain P. B. Dungan, U.S.N.....520
6. Lieutenant Commander M. S. Tisdale, U.S.N.....495
7. Captain Chauncey Shackford, U.S.N.....413
8. Commander C. C. Slayton, U.S.N.....349

Scattering 41

The Chairman then declared the following officers elected for the ensuing year:

For President:	Rear Admiral W. L. Rodgers, U.S.N.
For Vice-president:	Rear Admiral H. B. Wilson, U.S.N.
For Secretary:	Commander H. G. S. Wallace, U.S.N.
For Board of Control:	Commander John Downes, U.S.N.
	Brigadier General George Richards, U.S.M.C.
	Captain R. M. Watt (CC), U.S.N.
	Commander W. R. Van Auken, U.S.N.
	Captain P. B. Dungan, U.S.N.
	Lieutenant Commander M. S. Tisdale, U.S.N.

Rear Admiral Wilson, the newly elected Vice-president, then took the chair.

The Secretary submitted the following report:

Report of Secretary and Treasurer

Mr. President and members of the Institute:

It is fifty years, almost to the day, since the Naval Institute was founded. The first meeting was held on October 9, 1873. There were then thirty-six members. There are now in the neighborhood of 4,600. The history of those years is a record of service to the Navy and to the Nation. I will not, however, go into the history tonight, although interesting, for it has already appeared in the Proceedings of this month, and many of you have, no doubt, already read it. I will take up, rather, the work that has been accomplished during the past year, and the condition of the Naval Institute today.

The past year has brought many changes. Some of these have been in the appearance of the magazine; some in arrangement; some in the administrative and financial policy. It will, I think, be of interest briefly to review a few of these changes.

Membership

First in order perhaps should be taken up the statistics of the membership of the Institute. There has been completed, although the figures are not yet final, an analysis of the membership. So far as any record goes, it is the first time in the history of the Institute that such an analysis has been prepared. Each stencil of a member now bears a tab, the color and location of which indicate at a glance to what classification the member belongs. This will not only facilitate keeping track of the members but will greatly reduce the amount of clerical work involved, and will consideraby increase the accuracy of such work. It has made possible the analysis of membership; or, rather, it has made the labor involved in the analysis something that will permanently contribute to the service of the organization. As one instance of its value, I might mention that a great

number of addresses have been corrected; and it will be much easier than heretofore to keep them correct. The following is the result:

REGULAR MEMBERS

Commissioned Line Officers	2,068
Staff Corps: Medical 25, Supply 78, Chaplain 7, Math. 4, Construction 89, Civil Engineer 50, Warrant 64, Marine 67, Coast Guard 48	432
Midshipmen	51
Retired Officers: Commissioned Line 163, Staff 30, Warrant 5	198
Other Regular Members: Ex-U.S.N. 175, U.S.N.R.F. 391, Ex-U.S.N.R.F. 499, Professors U.S.N.A. 20, Ex-U.S.M.C. 3, Army 2	1,090
Total regular members	3,839

LIFE MEMBERS

Commissioned Line 77, Supply Corps 4, Construction Corps 6, U.S.N.R.F. 4, Ex-U.S.N.R.F. 4, Foreign 14, Domestic civilians 31, Army 1, Marine corps 1, Professors U.S.N.A. 2	144

ASSOCIATE MEMBERS

U.S.N.R.F. 41, Ex-U.S.N.R.F. 5, Army 14, Coast Guard 10, Domestic civilians 238, Foreign 87	395

MISCELLANEOUS

Honorary members	4
Members suspended for non-payment of dues	261
Total membership	4,643

While subscriptions are distinct from membership, it may be well also to insert in this place statistics regarding them. The figures are as follows:

Domestic subscriptions	288
Foreign subscriptions	303
Total subscriptions	591
Gratis copies are as follows:	
Domestic exchanges	23
Foreign exchanges	16
Advertisers' copies	49
Total gratis copies	88

The total circulation thus amounts to 5,322, including suspended members.

In connection with the question of membership, succeeding secretaries have, for many years, commented on the fact that the PROCEEDINGS are gotten out at a loss each year. They have repeatedly urged that the membership should be increased, claiming that, as the overhead and publishing cost, as well as the cost of articles, would then be distributed over a greater number of copies, the cost per copy would be less. To

me, it seems that that is an erroneous viewpoint, and that to follow it too blindly would be unfortunate. It has resulted, for example, in a too hasty acceptance of members. Not a few have joined, thinking that they were merely subscribing to a magazine for a limited period. This has, in the past, resulted in many misunderstandings. There has resulted also from the desire to expand, the continuing of a not inconsiderable number of members who were apparently reluctant to remain, and who had finally to be dropped, owing a considerable amount of dues. In the past year, there have been dropped for non-payment of dues, 166. The amount of dues so owed was $1,040. The total bad dues, not counting those still outstanding, has amounted in three years to more than $11,500. The total number of members so dropped in the same length of time was 1,342. It goes without saying that the retention of such members is a liability and not an asset. The amount of clerical work involved in the sending of repeated bills is very great. To my mind, it is eminently desirable that membership should be restricted to those having an interest in the objects for which the Institute was founded, and I feel that, by clearing out the deadwood, even if it should involve a considerable reduction in the membership, only good to the Institute could result. Certainly any desire for expansion should arise from other considerations than a reduced cost per copy.

It should further be pointed out that there is a limit in membership which cannot be exceeded without increasing the clerical force. Thus, the reduced cost per copy is by no means all gain; for with the increased membership comes either an increase in overhead, or else an increased number of errors, or both. The resulting net loss to the Institute is obvious. It is also a distinct loss to the Institute when a member resigns, having a feeling that he has been unjustly required to pay back dues for copies of the PROCEEDINGS which have never been received; or, in the event that he never does pay the dues, and eventually is dropped from the rolls, there is another loss, separate and distinct from the financial loss due to the sum of money involved.

The net change in membership of the Institute since the meeting a year ago is as follows:

Deaths	31
Resignations	226
Resignations effective December 31, 1923	60
Total	317
New members	239
Net loss	78
Members dropped	166
Total decrease	244

PROCEEDINGS

An effort has been made during the past year to improve the PROCEEDINGS both in the character and interest of articles, and in the appearance of the magazine itself. A different paper has been adopted. This, though comparatively thin and not a high gloss paper, is capable of satisfactorily taking engravings. A number of typographical changes have been made. It is believed that the PROCEEDINGS is well up to the standard, typographically and in other ways, of similar publications published elsewhere. Errors, of course, creep in. These are to be regretted; but with the amount of time that the editor is able to devote to the Institute, they cannot be entirely eliminated. For those that remain, I would ask from the members of the Institute their kind indulgence.

While on the subject of the appearance of the PROCEEDINGS, it may not be out of place to mention the cover. This now bears two seals; one the seal of the Naval Academy and the other the seal of the Naval Institute. As a matter of fact, neither seal is correct; and steps are already under way to substitute the correct seals at an early date.

The labor of supervising the affairs of the Institute has been a very great burden. This has been made much greater by reason of the change caused by the death, after a number of months of ill health, of Mr. James W. Conroy, the Trustee of the Institute for nearly forty years. As one of the steps in reorganization there has been appointed, with the authority of the Board of Control, an assistant editor, Lieutenant Commander Roy C. Smith, Jr. This additional officer has removed some of the burden from the shoulders of the Secretary and Treasurer.

The cost of getting out the PROCEEDINGS has been computed. On the basis of 65,800 copies, the number printed last year, the cost per copy, including payments to authors, but excluding overhead was $21,600 or .3283 per copy. The total overhead amounted to $18,100, sixty-four per cent of which is chargeable to the PROCEEDINGS, making an addition of $11,584, or .176 per copy. The total cost per copy thus averages .5043. It thus appears that for a number of years, the Institute has been permitting subscriptions to the PROCEEDINGS at considerably less than the actual cost. As a means of correcting this, the Board of Control in the past year raised the subscription price to $5.00. The membership dues, however, remain unchanged.

The net loss to the Institute for the publication of the PROCEEDINGS in the past year, including overhead, has amounted to $14,584. This has in part been offset by the book publishing business which, on a total business amounting to $43,900, has resulted in a profit of $10,757. From this profit there will have to be deducted certain amounts, not yet computed, for textbooks and other publications discontinued or practically obsolete.

ROYALTY TO WRITERS

A few years ago, there was a certain amount of criticism, not without justification, regarding the royalty paid to authors of certain textbooks

used by the midshipmen. This resulted in a plan adopted last year whereby all such royalties were eliminated. As a secondary result, the conditions governing the contracts were such that the Institute at the same time relinquished the greater part of its own legitimate profits, to which it is entitled for the risks involved in the book publishing business.

The condition was further complicated by the fact that the annual sales of such textbooks have been considerably reduced, and will be further reduced in future, from the practice of turning in second-hand books to the Midshipmen's Store for re-issue to succeeding classes. The size of editions will therefore be much smaller, the prospective yearly demand problematical, and the risk of being left with a considerable proportion of the edition after a textbook has been dropped from the curriculum, considerably increased.

A new policy has recently been adopted whereby the authors will receive a reasonable compensation for their labor, depending on the size and character of book and work involved, but limiting the amount of such compensation which may be received from the midshipmen; retaining, however, a reasonable royalty on all outside sales. The details of the plan are too long to go into here. Suffice it to say that the interests of the Institute have been looked out for, and the compensation to be received by authors is more nearly commensurate with the labor involved than formerly obtained. A number of new contracts have been drawn up, embodying the new feature, and so far, without exception, the authors have been as well, or better, satisfied. I might add that when an author ceases to receive royalty on books sold to midshipmen, the amount of royalty so relinquished is applied to reduce the cost to midshipmen on subsequent sales of the book.

The future, of course, will have its own problems to solve; but I believe that the book publishing business is now established on a firm basis, instead of being, as formerly, headed toward bankruptcy.

New Books

A number of new books have been printed during the past year, and others are now in course of preparation. Among the former are: *Reciprocating Engines and Auxiliary Machinery,* Barton, Stickney, McCloy and Beneze; *Personnel,* Soule; and *Physiology* (revised edition) Heiner. Among those in preparation are: *Manual of Radio Telegraphy and Telephony* (revised edition) Robison; *Naval Construction* (revised edition) Robinson; and *Handling Personnel.* The last named book will be a compilation largely from the essays submitted to the Institute in competition for the prize awards. If the book serves the purpose for which it is intended: viz., to give the midshipmen a thorough understanding of that vitally important subject, it will be of great value, not only to the Naval Academy, but to the service at large; and few are the officers who cannot be benefited by its perusal.

Changes During the Year

Among the changes which have taken place from time to time, with the approval of the Board of Control, might be mentioned the following: The number of gratis copies of the Proceedings has been greatly decreased; the amount of advertising space taken by the Institute, where such space seemed to bring in little or no return, has been either cut down in amount or entirely eliminated; the membership of the Institute in the Audit Bureau of Circulation has been discontinued, as there seemed to be no way in which the Institute might receive any return for money expended; the bound copies of the Proceedings will be discontinued, commencing with January 1, 1924; all foreign members, including life members, will, in future, pay the necessary additional amount for foreign postage.

Changes in Net Worth

During the past year, without taking into consideration any change in the market value of bonds owned by the Institute, except in the case of actual sale, there has been an increase in net worth of $2,876. From this should be subtracted the interest on money and investments of the Institute, amounting to $6,703, leaving a net loss for the year of $3,827 on the actual business done. Before the year is done, there will be a few items to charge off, which will further increase this loss. I feel, however, that, considering the matter from all points of view, the Institute is on a sound financial basis.

Changes in Investments

There has been adopted by the Board of Control a financial policy to regulate future investments of the Institute. A considerable change has been made in the holdings of the Institute, which change, without departing from the high quality of investments necessary to an institution of this kind, nevertheless brings in a bigger return. Advice has also been sought of the most competent investment authorities of the country, and if the practice be continued, and the policy as adopted be adhered to in the future, there is little doubt that the investments of the Institute will continue to be sound, and at the same time will bring in a good return.

The Future of the Institute

By all means let us increase our membership, and let it include all those interested in the object for which the Institute was founded: namely, "the advancement of professional, literary and scientific knowledge in the Navy." It is difficult to see how any officer, interested in his profession, can afford not to belong, for professional reasons as well as sentimental. Let the membership include any civilians who are likewise interested. The wider the circulation of the Proceedings, the better. It is now included in a number of libraries. It will bring the Navy to the people.

As an instance of the affectionate regard in which the Institute is held by many of its members, Mr. William Boerum Wetmore, a life member

since 1889, unhappily deceased, has left to the Institute a legacy of $2,500. There is another instance of an officer, a member for over forty years, but long since retired from active service, and with eyesight now too poor even to read the PROCEEDINGS, who continues his membership and pays his dues each year. To us who are still in the forefront of the battle, such sentiment must be an inspiration.

The arduous labors of the Institute's early years are gone. The future lies ahead. With fifty years of loyal service in the past, and with a firm foundation, the Institute may look forward with confidence to the future.

The report of the Secretary was approved, and upon motion the Secretary was given a vote of appreciation for his very thorough and complete report.

A general discussion then ensued, which will be found recorded in the annual minute book of the Naval Institute.

There being no further business, the meeting adjourned at 9:05 P. M.

H. G. S. WALLACE,
Commander, U. S. Navy,
Secretary and Treasurer.

SECRETARY'S NOTES

Membership

Present Membership, 4652. Changes since January 1, 1923: New Members, 208. Resignations, 78. Deaths, 21. Total Increase, 109.

Subscription Rates

In order to bring the subscription rate more nearly in line with the cost of publication, the Board of Control has increased the subscription rate to $5.00 per year. A special rate of $3.50 per year is made to members only (not available to societies or organizations) in order that they may send subscriptions for the PROCEEDINGS to their relatives and friends. (Foreign postage 50 cents extra in all cases). Subscriptions are automatically discontinued at expiration.

Bound Copies

For a number of years, members desiring bound copies of the PROCEEDINGS have been able to obtain these for a slight additional payment, recently amounting to $4.00 per year. The actual additional cost to the Institute is approximately $16.97 per member per year. The net loss of approximately $13.00 per member per year has been borne by the Institute. As the number of bound copies per issue is only seventeen, the Board of Control has decided to discontinue furnishing bound copies, effective 1 January, 1924.

Foreign Postage

For a number of years members residing abroad have been paying fifty cents extra per year for foreign postage, which does not quite cover the additional cost to the Institute at the present time. Life members residing abroad have not heretofore made this payment. The Board of Control has decided that all classes of membership shall be treated on the same basis, and life members residing abroad will, therefore, be required to pay fifty cents per year for foreign postage, effective 1 January, 1924.

Articles The Institute desires articles of interest to all branches of the service, including the reserve force. Non-members as well as members may submit articles, and authors receive due compensation for articles published. Compact, well digested articles are more likely to be accepted for early publication. In accepting articles for publication, the Institute reserves the right to have such articles revised or rearranged, where necessary, in order to bring them up to the required standard of articles published in the PROCEEDINGS—the cost, if any, to be deducted from the compensation due the author.

Reprints of Articles Twenty copies of reprints are furnished authors free of charge. Additional copies to the number desired will be furnished at author's expense, provided request is made before going to press.

Discussions Discussion of articles published in the PROCEEDINGS is cordially invited. Discussions accepted for publication are paid for at approximately one-half the rate for original articles.

Book Reviews As soon as practicable after the publication of books on subjects of professional interest, the Institute aims to publish authoritative reviews of them.

Address of Members In the past, many errors have resulted from the habit of changing an officer's address as soon as his transfer orders are published in the papers. No change will be made in the future except upon receipt of the Navy Directory, or notification by the member concerned. Reliance upon the former method may, in extreme cases, mean a delay of almost four months.

To insure the prompt delivery of the PROCEEDINGS and other communications from the U. S. Naval Institute, it is essential that members and subscribers *notify the Secretary and Treasurer without delay of every change of address.* No responsibility can be accepted for failure to receive the PROCEEDINGS, where members fail to comply with this rule. Changes of address should reach the Institute by the 25th of the month, to be effective for the issue of the PROCEEDINGS of the following month.

H. G. S. WALLACE,
Commander, U. S. Navy, Secretary and Treasurer.

INDEX TO VOLUME 49

Figures in bold type indicate whole number: light figures following indicate page number.

A

Adamson, K. F.
Discussion of "Life insurance as applied to the naval service." **243,** 853.

Aerial photography.
See Photography.

Aerial warfare.
Grow, H. B. Bombing tests on the *Virginia* and *New Jersey*. **250,** 1987.
Jackson, J. P. Discussion on employment of aircraft in naval warfare. **239,** 117.
Voitoux, G. New weapons and old ones. **248,** 1635.
Air bomb menace. **249,** 1933.
Aviation and the Navy. **250.** 2072.
Navy questions air triumph. **249,** 1923.
U. S. may act on pact to curb air warfare. **247,** 1547.

Aerology.
Aerological plotting board designed. **247,** 1557.

Aeronautics.
Ericsson, E. L. Maneuvering aircraft in formation. **239,** 79.
Tinker, C. A. Airships a necessity for the U. S. **249,** 1926.
Aerial transport. **248,** 1740.
Air supremacy. Statistics of various nations. **243,** 882.
Anti-lightning equipment. **243,** 875.
Battleship holds lead against plane. **246,** 1377.
Fighting aircraft with radio. **246,** 1368.
French sky hornets and world's air navies. **247,** 1549.
Future of world's aviation. **248,** 1737.
General rules for air combat. **240,** 349.
Growth to 1923 of European air lines. **246,** 1363.
Illustration of 7-plane observation squadron in flight. **243,** 828.
Influence of air reconnaissance on strategy and tactics. **240,** 362.
London air conference, 1923. **243,** 875.
Map showing European commercial air lines. (1923). **247,** 1557.

Aeronautics.—Cont'd
Refueling in flight. **247,** 1558.
Relative strength European air navies. **241,** 507.
What the various countries are doing in aviation (1923) **245,** 1207.

Aircraft
Deck-landing naval spotting machine. **241,** 509.
Dirigible to carry planes. (*T.C.*2). **245,** 1209.
Eight-gun airplane. **242,** 698.
England's wonder aircraft. (1923). **242,** 698.
Extensible wings for aircraft. **240,** 348.
Keel laid for trans-Atlantic airship (1923). **249,** 1913.
Knock-down planes for subs. **249,** 1911.
Martin observation plane. **240,** 347.
New U. S. Navy dirigibles. **247,** 1553.
Twenty-passenger plane under construction. **246,** 1361.
Pilotless airplanes. **239,** 166. **240,** 348.
Silent aircraft. **239,** 169.
Submarine planes. **248,** 1727.
Titanic British planes. **247,** 1557.
World's largest plane launched at Dayton. **247,** 1561.
See also: Gliders.

Bombing
Grow, H. B. Bombing tests on the *Virginia* and *New Jersey*. **250,** 1987. **249,** 1923.
Aerial bombardment maneuvers with warships. **248,** 1735.
Air bomb menace. **249,** 1933.
Army bombing tests, November, 1922. **239,** 171.
Tests of 4,000-lb. bomb. **246,** 1361.

Long distance flights
2,000-miles non-stop flight. (1922). **239,** 170.

Motors
Vincent, J. C. Packard Mod. 1551. -300 h. p. airship engine. **247,** 1541.

Aeronautics.—Cont'd
American engine tests interest British. **248,** 1736.
Endurance run of Wright E4 engine. **244,** 1039.
High compression engines for aircraft. **249,** 1929.
Steam engines for airplanes. **249,** 1922.
Turbines for aircraft. **246,** 1368.
Vibration causes most engine failures. **247,** 1554.

Navigation

Lakehurst mooring mast. **239,** 166.
Lighthouses for air pilots in operation at Hampton Roads. **239,** 166.
New aeronautical instruments. **241,** 512.

Records

Altitude record of 6.7 miles. **248,** 1741.
World's records established at San Diego (1923). **247,** 1559.
See also: Names of races; Pulitzer race, etc., for speed records.

France

Aerial budget, 1923. **250,** 2057.
France meets menace of German aerial plans. **247,** 1504.
French aeronautical progress, 1923. **249,** 1897.
French airforce plan, 1923. **250,** 2063.
France naval aviation, 1923. **246,** 1343.

Germany

Outline of 1923 air program. **248,** 1717.

Great Britain

Airships and British defense. **250,** 2057.
An air policy at last. **247,** 1497.
Britain bases airship planes on U. S. program. **248,** 1714.
British policy requires airships. **249,** 1881.
Government call for three types of machines for building up fleet. **247,** 1496.
Necessity of increase in British air force (1923). **244,** 1013.

Japan

Appropriations, 1922. **241,** 508.

U. S. *Navy*

Tinker, C. A. Airships a necessity for U. S. **245,** 1223.
Army and Navy aviation questions. **246,** 1363.
Large air force for U. S. urged. **247,** 1548.

Aeronautics.—Cont'd
Ramsey, DeWitt C. Development of aviation in the fleet. **247,** 1395.
Aviation and the Navy. **250,** 2072.
Naval reserve aviation. **248,** 1734.
Fleet aviation at Panama. **245,** 1210.
Strength of aircraft squadrons. **241,** 507.
See also: **Aerial warfare.**

"Agamemnon" (*S. S.*)
To be reconditioned. **243,** 868.

Aircraft carriers.
Are huge carriers worth while? **243,** 873.
British aircraft carriers (1922). **241,** 485.
Largest cruising airdrome. **240,** 329.
See also: Names of vessels.

Air preheaters.
Howden-Ljungström preheater. **250,** 2092.

Alden, C. S.
Review of Benson's Merchant marine. **246,** 1391.

Alger, Philip R.
Appreciation of services to the Institute. **248,** 1606.

Algeria.
Niblack, A. P. Barbary pirates, Algeria, etc. **242,** 571.

"Allegheny," (*U. S. S.*)
Davison, R. and Royce, D. Salvage of the U. S. S. *Allegheny*. (Illus.) **242,** 631.

Amalgamation of corps.
Baker, C. S. Discussion on "Amalgamation." **246,** 1326.
Bassler, R. E. Discussion of "Amalgamation." **246,** 1332.
McIntosh, K. C. Discussion of proposed amalgamation bill. **245,** 1161.
Smith, Oscar. Back to normalcy with amalgamation. **250,** 2030.
Snow, Elliot. Discussion of proposed amalgamation bill. **245,** 1163.
Twining, N. C. Discussion of proposed amalgamation bill. **245,** 1157.

"America" (*S. S.*)
To be reconditioned. **243,** 868.

Ammunition.
Breaking down of ammunition. **243,** 1749.

Amundsen, Ronald.
Abandons polar flight. **247,** 1574.

Anatolia.
See Chester concession.

Anderson, W. S.
Strategy and logistics of Dardanelles campaign. **245,** 1127.

Andrée, S. A.
Attempt to cross the pole in balloon. **244,** 940.
Annapolis radio station.
To have "rat-tail" tower. **247,** 1568.
Annealing.
Annealing processes and their effectiveness. **249,** 1921.
Argentina.
Gil, E. Opposition between Argentine and Brazil. **250,** 2126.
Armknecht, Richard F.
The average naval officer—an estimate. **250,** 2040.
Ashbrook, A. W.
Naval mines. **240,** 303.
Athletics.
Carpenter, D. N. Discussion on "Athletics, beneficial and otherwise." **249,** 1873.
Niblack, A. P. Athletics, beneficial and otherwise. **248,** 1609.
Nielson, J. L. Athletics. **247,** 1431.
See also: Physical training.

Navy

Australia.
End of Australia's naval establishment. **244,** 1012.

B

Babbitt, H. S.
Proposed modification—for the personnel selection law. **244,** 965.
Baker, C. S.
Discussion on "Almagamation," **246,** 1326.
Balloon races.
Results of 14th national balloon race. **247,** 1561.
Baltimore "Sun."
Editorial on Tisdale's "Naval Academy of Today." **249,** 1876.
Bassler, R. E.
Discussion on "Amalgamation." **246,** 1332.
Education and training of officer personnel. **249,** 1918.
Battleship organization.
Esler, J. K. Suggestion regarding battleship organization. **249,** 1805.
Battleships.
Announcement of the Navy Dept. of sale of battleships and cruisers. **249,** 1909.
Battleship holds lead against plane. **246,** 1377.
British stick to battleships for defense. **239,** 136.
The "conference battleship," (Illus.) **245,** 1221.
Battleships.—Cont'd
Cost of warship upkeep. **249,** 1889.
Future fighting ships—an impression. **241,** 483.
New British battleships (1923). **242,** 673.
Sale of U. S. Battleships scrapped under treaty. **249,** 1909.
Baum, G. M.
Common sense training the service pistol. **246,** 1309.
Bayly, Sir Lewis. (Brit. Navy)
Portrait. **239,** 41.
Belknap, Reginald R.
Study of strategy. **239,** 1.
Bellevue (D. C.) U. S. Naval Experiment and Research Lab. Airplane view of **247,** 1395.
Blackburn, C. K.
Discussion of Webb's "Life insurance and the naval service." **240,** 313.
Bogush, H. R.
Does the Navy need a naval reserve force? **247,** 1419.
Boilers.
Boiler pressure of 3,200 lbs. practicable. **247,** 1357.
Mercury boiler in operation. **248,** 1742.
Twirling tubes increase steam pressure (Illus.) **243,** 871.
Yarrow water-tube boiler with Mermode system of oil firing. **244,** 1035.
Bombing tests.
See Aeronautics—Bombing.
Bonin Islands.
Bywater, H. C. Japan's policies in the light of disaster. **250,** 2067.
Kawakami, K. K. Reply to Bonin Islands charge. **250,** 2070.
Book reviews.
Barnes, E. C. Alfred Yarrow, his life and work. **250,** 2128.
Beach, E. L. Dan Quin of the Navy. **239,** 201.
Benson, W. S. Merchant marine. **246,** 1391.
Bernotti, R., Guerra marittima, Vol. I. **243,** 892.
Bowen, W. S. comp. Operations of 29th Division. **248,** 1767.
Buell, R. L. Washington Conference. **242,** 732.
Bullen, F. T. Frank Brown, sea apprentice. **246,** 1391.
Castex, Captain. *Synthese de la guerre sousmarine.* **249,** 1852.
Cedee, F. T. A. Nautical Tables. **245,** 1233.

Book reviews.—Cont'd
Chack, P. *Guerre des croiseurs.* **242,** 729.
Chase, G. P. Position finding at sea. **245,** 1232.
Chatterton, E. K. *Q*-ships and their story. **241,** 537.
Cugle, C. H. Practical advanced navigation. **240,** 379.
Douin, G. *Campagne de Bruix en Mediterranee,* 1799. **248,** 1766.
Gibbons, H. A. Introduction to world politics. **242,** 721.
Graf, H. Russian navy in war and revolution. **248,** 1764.
Hudson, W. H., and Guernsey. The U. S. from discovery of continent to end of World War. **247,** 1594.
Jane's Fighting Ships, 1922. **244,** 1070.
Knox, Sir Alfred. With the Russian Army, 1914–17. **244,** 1067.
Latham, E. Marine works. **247,** 1596.
Leask, A. R. Marine engines. **247,** 1595.
Niblack, A. P. Why wars come. **241,** 544.
Parsons, W. B. Robert Fulton and the submarine. **247,** 1592.
Pounder, C. C. Machinery and pipe arrangement on shipboard. **239,** 199.
Raleigh, Walter. War in the air, Vol. I. **242,** 732.
Reed, E. G. Essentials of transformer practice. **248,** 1765.
Satow, Sir E. Guide to diplomatic practice. **247,** 1585.
Sothern, J. W. M. Notes and sketches on marine Diesel engines. **242,** 736.
Stone, E. W. Elements of radio communication. **247,** 1597.
Brayton, H. M. Derivation of mathematical formulae for volume and center of gravity of a projectile. **236,** 1767 (*see also*: correction) **239,** 126.

Brazil.
Gil, E. opposition between Argentine and Brazil. **250,** 2126.
U. S. Naval mission to Brazil objected to by Argentine. **241,** 496.
Brazil rejects naval proposals. **243,** 890.

Navy
Strength of Brazilian Navy. (1923). **240,** 335.

British lifeboat service. (Illus.) S. C. Douglas. **247,** 1473.

Budget allocation of the dollar. **240,** 332.

Bulkheads.
Snow, Elliot. Origin of watertight compartments. **242,** 601.

Bullard, W. H. G.
Past and present radio situation in U. S. **248,** 1623.

Bullets.
High-range boat-tail bullet. **242,** 700.

"Burns" (*U. S. S.*)
Illustration. **241,** 387.

Bywater, Hector C.
America not to blame if treaty fails. **244,** 1043.
Enemies of the battleship. **248,** 1714.
Europe's politicians insincere. **250,** 2113.
Japan: a sequel to the Washington Conference. **243,** 811.
Japanese policies in the light of disaster. **250,** 2067.
Japanese sea power. **247,** 1510.
Japan's defense problems. **248,** 1720.
More data on naval expansion in Japan. **245,** 1189.
On submarine warfare. **246,** 1373.
U. S. Navy can help keep Asia quiet. **243,** 878.

C

Cabot, Godfrey L.
Discussion of "Capital ships and poison gas." **248,** 1694.

"California" (*U. S. S.*)
Air photo. **240,** 203.
Illustration. **243,** 739.

Cargo handling.
Flexible steel pipe for loading and discharging tankers. **246,** 1359.

Carpenter, D. N.
Discussion on "Athletics, beneficial and otherwise." **249,** 1873.

Central American Conference, 1922-23.
Work of. **242,** 720.

Charlton, A. M.
Discussion of "Capital ships and poison gas." **248,** 1693.

Charts, naval.
Contour map of ocean bed. **244,** 1041.

Chester concession.
Turkish concessions to Adm. Chester. **244,** 1063.
Work on concession begins in November, 1923. **250,** 2124.

Chile
Earthquake, 1922. U. S. sends relief ships. **239,** 156.

China.
Bandit captives released. (June, 1923). **246,** 1388.
Bandits hold foreigners for ransom. **245,** 1231.

China fleet (U. S. Navy).
Where our navy is "ridiculous." **249,** 1907.
Chinese Eastern Railway.
Control restored to China. **239,** 197.
"Colorado" (*U. S. S.*) (*first*)
Illustration. **249,** 1880.
Illustration. **249,** 1773.
"Colorado" (*U. S. S.*) (*modern*)
Most powerful battleship afloat. **248,** 1726.
Compass
Earth induction compass for ships. **244,** 1040.
Gyro compass in navigation. **239,** 173.
Composition.
Smith, C. A. How to write a scientific article. **245,** 1123.
Conrad, Charles.
Year in Haiti's customs and fiscal service. **242,** 605.
Concrete ships.
Durability of. **246,** 1356.
Condenser tubes.
Cause of corrosion of. **249,** 1917.
Conference on Limitation of Armament.
Knapp, H. S. Limitation of Armament at the Conference of Washington. **243,** 767.
Case against the naval treaty. **246,** 1383.
Effect of conference on U. S. Naval policy. **249,** 1904.
France and the Washington Treaty. **244,** 1046.
France ratifies treaty. **247,** 1502.
Results of the conference. (Extracts from address by Secretary of State Hughes). **241,** 521.
Treaty ratified by Italy. **242,** 702-717.
See also: Limitation of Armament.
Conroy, James W.
Appreciation of his services to the Institute. **248,** 1606.
Conscription.
New conscription legislation. **240,** 334.
Constantinople.
Evacuated by Allies. **250,** 2124.
Continuous voyage.
Wainwright, R. Doctrine of continuous voyage. **244,** 903.
Contraband.
Wainwright, R. Contraband. **244,** 299.
Conversion of steamers to Diesel drive. **249,** 1916.
Convoys.
Taussig, J. K. Destroyer experience in the Great War. **240,** 221.
Coontz, R. E.
The Navy. **243,** 747.
Co-ordinators—Who? What? Why?
C. F. Russell. **250,** 2035.
Corfu, Bombardment of, 1923.
Seizure of Corfu. **249,** 1944.
The shelling at Corfu. **249,** 1941.
Correspondence.
Goodrich, C. F. Navy's paper work. **241,** 465.
Corrosion.
Cause of corrosion of condenser tubes. **249,** 1917.
Remedy for condenser corrosion. **248,** 1742.
Cotton manufacture.
British control of the industry. **242,** 716.
Courts-martial.
Parker, T. D. Evidence. **242,** 643.
Cowes air races, 1923.
U. S. expects to win. **248,** 1737.
Cowie, T. J.
Discussion of life insurance as applied to naval service. **241,** 479.
Cranes.
Largest floating crane. **249,** 1915.
Craven, F. S.
Discussion on personnel selection law. **247,** 1493.
We must have it. **244,** 949.
Crenshaw, R. S.
Autobiographic sketch of Thomas Jefferson Page. **248,** 1661.
Cross, F. E.
Merchant marine personnel and Navy interest. **239,** 71.
Cruisers.
Comparison of French cruisers and flotilla units. **245,** 1184.
Cruiser shortage in the British Navy. **249,** 1886.
Japan to have most powerful cruisers. **241,** 493.
Japanese light cruiser of new type. (1923). **244,** 1020.
New French light cruisers (1923). **245,** 1182.
New type of French cruisers (1923). **249,** 1896.
New type Japanese cruisers (1923). **248,** 1719.
Crux (Motorship).
Description. **249,** 1912.
"Cyclops" (*U. S. collier*).
Mystery still causes speculation. **247,** 1569.

D

Dardanelles.
Question of the straits. **240,** 369.
Dardanelles campaign.
Anderson, W. S. Strategy and logistics of Dardanelles campaign. **245,** 1127.
Davis-Douglas torpedo plane.
Illustration. **242,** 553.
Davison, Ralph, and Royce, Donald.
Salvage of the *U. S. S. Allegheny.* Illus. **242,** 631.
Day marks.
New day mark for power vessels at anchor. **243,** 878.
"Dent" (*U. S. S.*). Illustration. **241,** 400.
De-commissioned destroyers.
Tilley, B. F. Handling 117 decommissioned destroyers. **245,** 1105.
"Denver" (*U. S. S.*).
To make important soundings. **244,** 1041.
Destroyer experiences in the Great War.
J. K. Taussig.
Part I—**238,** 2015.
Part II—**239,** 39.
Part III—**240,** 221.
Part IV—**241,** 383.
Destroyers.
Weems, P. V. H. Decommissioning destroyers at Philadelphia. **241,** 449.
Modern torpedo craft. **240,** 367.
"Detroit" (*U. S. S.*).
Illustration. **248,** 1701.
Speed trails. **246,** 1349.
Direction finders.
Improvement in direction finding, 1923. **250,** 2110.
Discipline.
King, E. J. Wrinkle or two in handling men. **241,** 427.
Moses, S. E. Preventive discipline. **247,** 1441.
Distress signal (radio).
"S. O. S." or a substitute? **249,** 1936.
"Dixmude" (*Fr. dirigible*).
Makes 4,500 mile record. **250,** 2083.
Docks.
Giant floating docks (1923). **247,** 1499.
Todds to build new dry dock. **243,** 869.
World's largest floating dock. (1923). **239,** 166.
Douglas, S. C.
British lifeboat service.
(Illus.) **247,** 1473.
Downes, John.
Navigation vs. the junior naval officer. **241,** 469.
Review of Cugle's "Practical advanced navigation." **240,** 379.
Doyle, Walter E.
Selection and graded retirement. **250,** 1999.
"Drottningholm" (*S. S.*).
Record run of. **249,** 1912.
"Duguay-Trouin" (*Fr. Cruiser*)
Launched; description. **248,** 1715. **250,** 2063.
Dyson C. W.
Discussion on "Part of engineering in command." **243,** 844.

E

"E. 7" (*British submarine*)
Engagement with railroad train. **242,** 659.
Sinking of—**242,** 659.
"E 11" (*British submarine*)
First cruise of. **242,** 652.
Second cruise of. **242,** 655.
"E 12" (*British submarine*)
An adventure of. **242,** 653–658.
"E 14" (*British submarine*)
First cruise of. **242,** 651.
"E 15" (*British submarine*)
Destruction of. **242,** 649.
Earle Ralph.
Discussion on "We must have it." (Gunnery school) **247,** 1491.
Earth features and the Navy pilot.
Fitzhugh Green.
249, 1773.
Earthquakes.
See Seismic disturbances.
Education, Naval.
See Naval education.
Electric batteries.
Relative merits of three methods of charging. **243,** 870.
Electric propulsion of vessels.
Shaw, J. B. Electric vs. geared drive. **247,** 1536.
Electric ship propulsion. **244,** 1032.
Electrical engineering.
Twelve thousand volt. d. c. generator. **248,** 1745.
End of the trail.
N. C. Gillette. **244,** 915.
Engineer Department.
Esler, J. K. Preparing the engineer department for battle. **245,** 1085.
Engineering.
See Marine engineering.
Engineering experience its value to the Captain.
P. W. Foote. **246,** 1243.
Engineers.
Training of British naval engineers. **241,** 485.

Engines, internal combustion.
See Internal combustion engines.
Ericsson, Edward L.
Maneuvering aircraft in formation. **239,** 79.
Note on death of. **239,** 79.
Esler, J. K.
Preparing the engineer department for battle. **245,** 1085.
Suggestion regarding battleship organization. **249,** 1805.
Esperanto.
Universal language convention 1923. **247,** 1575.
"Essex" (*U. S. frigate*).
Illustration. **239,** 1.
Estimating.
Rock, G. H. Planning and estimating navy yards. **244,** 969.
European War, 1914–'18.
Wainwright, R. Laws and customs of of war at sea as affected by the World War. **244,** 897.
Torpedoes and naval mines in the war. **244,** 1016.

Casualties

New figures on German naval losses in the war. (1923). **246,** 1345.

Indemnity

What Germany has paid to date. (1922). **240,** 329.

Naval operations

Taussig, J. K. Destroyer experiences during the great war.
Part I—**238,** 2015.
Part II—**239,** 39.
Part III—**240,** 221.
Part IV—**241,** 383.
Operations after battle of Jutland. **239,** 150.
Wasp's nest in Flanders. **241,** 491.

Submarine operations

Castex, Captain. *Laguerre sous-marine* (*book review*). **249,** 1852.
Frost, H. H. British submarines in Turkish waters. (Map). **242,** 647.
Sims, W. S. On the submarine campaign. **246,** 1373.
German submarine statistics. **248,** 1718.
Evaporators.
Latest Navy evaporator practice. **248,** 1744.
Evidence.
Parker, T. D. Evidence. **242,** 643.
Explosives.
Breaking down of ammunition. **248,** 1749.
Explosives.—Cont'd
Liquid oxygen as a high explosive. **244,** 1042.
A new powder. **248,** 1750.

F

Farragut, David Glasgow.
Goodrich, C. F. Farragut. **250,** 1961.
Portrait. **250,** 1961.
Federal reorganization.
Plan to await study; outline of proposed changes. **242,** 707.
Field hospitals.
See Hospitals.
Fifty years of service.
Smith, Roy C. **248,** 1601.
Fisher, C. W.
Proposed amalgamation bill. **244,** 919.
Fisher, J. O.
Review of Parson's Robt. Fulton and the submarine. **247,** 1592.
Fiume dispute.
Agreement made between Rome and Belgrade. **250,** 2123.
Fiume dispute renewed. (1923). **249,** 1946.
Fleet, The.
Hinds, A. W. Sea service made easier and more efficient. **245,** 1097.
Twining, N. C. Discussion of "Administrative flagship," and "Fighting leader for the fleet." **243,** 847.
Illustration showing battlefleet in Panama Bay. **243,** 779, 803.
Fletcher, F. F.
War time control of industry. **246,** 1237.
Flettner rudder.
How it works on the *Odenwald*. **247,** 1533.
Flow-meters.
Electric flow-meters. **241,** 503.
Fog.
Dispersal of fog by electricity. **242,** 698.
Marine fogs in the U. S. **250,** 1204.
Two kinds of fog at sea. **240,** 352.
Foote, P. W.
Engineering experience; its value to the captain. **246,** 1243.
Fouling.
Anti-fouling compositions compared. **246,** 1360.
Vessel's bottom o.k., after thirteen years in water. **249,** 1942.
France.
Niblack, A. P. Letters of a retired rear admiral. French finances, culture, etc. **241,** 435.

France.—Cont'd

Colonies

Niblack, A. P. Colonial possessions of France. (letters of a retired rear admiral) **240,** 261.

Foreign relations

Alliance with Czecho-slovakia. **250,** 2122.

Naval policy

Pautrau, J. B. France to remain great naval power in spite of treaty. **248,** 1716.
Raiberti on French naval policy. **249,** 1893.
Command of the western Mediterranean **250,** 2060.
France and the naval treaty. **239,** 174.
French naval statute. (1923). **244,** 1013.
Mastery of the Mediterranean. **249,** 1895.

Navy

Composition of the fleet. (1923). **244,** 1015.
Effect of an oil blockade on French Navy. **239,** 180.
France and the naval treaty. **239,** 174.
French Navy and the naval treaty. **241,** 514.
French Navy and Washington Conference. **243,** 858.
New French Navy. (1923). **245,** 1186.
Our new light cruisers. (1923). **245,** 1182.
Present French naval power (1923). **240,** 326.
Rebuilding of French Navy (1923). **239,** 140.
247, 1500.
Strength, 1923. **244,** 1015.

Personnel

New personnel law, 1922. **241,** 487.

Program

Naval construction program, 1923. **241,** 487.
Program and budget, 1923. **242,** 676, 679.
Progress in construction, 1923. **250,** 2057.

"France" (*Fr. battleship*)

Refloating the *France*. **249,** 1896.

Franklin, Benjamin.

Snow, Elliot. Model tank experiments by Benj. Franklin. **247,** 1469.

Fresh water requirements of liners. 249, 1911.

Frost, H. H.

British submarines in Turkish waters. (Map) **242,** 647.
Spirit of the offensive.
Part II—**239,** 97.
Part III—**240,** 269.

Fuel.

Effect of an oil blockade on France. **239,** 180.
Naval petroleum reserves. **239,** 332.
Progress in liquid fuels. **239,** 159.

G

Gardiner, William H.

What the U. S. Navy costs and who pays for it. **243,** 828.

Gas masks.

New gas mask permits speech. **244,** 1043.

Gas warfare.

Cabot, G. L. Discussion of "Capital ships and poison gas." **248,** 1694.
Charlton, A. M. Discussion of "Capital ships and poison gas." **248,** 1693.
Hains, Paul W. Protection of battleships against poison gas. **245,** 1113.

Gautrau, J. B.

France to remain great naval power in spite of treaty. **248,** 1716.

Gear drive.

Efficiency of various types of drive. **250,** 2096.
New invention may eliminate toothed gear trains. **247,** 1544.

Geology.

Green, Fitzhugh. Earth features and the Navy pilot. (Illus.) **249,** 1773.

Germany.

Rhineland republic proclaimed. **250,** 2121.
A view of Germany from within. **247,** 1508.

Foreign relations

Ludendorff predicts early German War (1923). **249,** 1897.
Russo-German war plot. **249,** 1899.

Navy

German naval progress, 1922. **242,** 682.
Germany's sea interests (1923). **247,** 1506.
Naval plans, 1923. **239,** 143.

Navy Yards

Fate of Danzig yard. **239,** 150.
See also: Rhur district.

Gibraltar.

To be world's greatest aviation base. **239,** 139.

Gil, Emmigue.
Opposition between Argentine and Brazil. **250,** 2126.
Gill propeller.
Description. **250,** 2088.
Gillette, N. C.
End of the trail. **244,** 914.
Gleaves, Albert.
Review of Chack's *Guerre des croiseurs.* **242,** 729.
Gliders.
Seven hour glider record. **241,** 508.
"Goeben" (*Ger. cruiser*).
The *Goeben* story. **246,** 1346.
Goodrich, Casper F.
Discussion of "Navy's paper work" (Letter). **246,** 1323.
Farragut. **250,** 1961;
Navy's paper work. **241,** 465.
Graham, S. V.
Discussion on "Why don't they stay in?" **250,** 2048.
Great Britain. Coast guard.
Reorganization of the service. **239,** 139.
Revival of British Coast Guard. **250,** 2056.

Defense

British labor and defense of the empire. **240,** 321.
Can the empire be made safe? **248,** 1701.
Ministry of Defense project found not practical. **249,** 1883.

Foreign policy

British foreign policy in 1923. **239,** 137.

Foreign relations

Politics and armaments. **249,** 1890.
Singapore a "threat to Japan." **249,** 1888.
U. S. naval expansion not feared by British. **246,** 1370.

Naval policy

British fleet distribution. **250,** 2055.
Can the empire be made safe? **248,** 1701.
England's traditional naval policy. **248,** 1713.
One-power standard. **245,** 1177.
Reorganizing naval defenses. **246,** 1341.

Navy

British naval efficiency. (1923). **240,** 322.

Great Britain Navy.—Cont'd
British Navy and the naval treaty. **241,** 513.
Comparative data tables for navies of U. S., Great Britian and Japan. **246,** 1372.
Cruiser shortage. **249,** 1886.
Does Britannia still rule the waves? **250,** 2057.
Engineer training in British Navy. **247,** 1526.
New British battleships (1923). **239,** 131.
Submarines and British Navy. (1923). **240,** 319.

Personnel

British submarine personnel. **240,** 322.
Green Fitzhugh.
Across the pole by plane. **244,** 937.
Earth features and the navy pilot. (Illus.) **249,** 1773.
Greene, F. V.
Discussion of "Merchant marine personnel." **242,** 669.
Green, S. Dana.
The *Monitor* at sea and in battle. **249,** 1839.
Grow, H. B.
Bombing tests on the *Virginia* and *New Jersey.* **250,** 1987.
Gunga Din.
Origin of the famous character. **247,** 1575.
Gunnery.
Earle, Ralph. Discussion on "We must have it." (gunnery school). **247,** 1491.
Slawson, P. S. Discussion on "Naval gunnery school." **249,** 1875.
Advanced rules for gunnery exercise. (1923). **245,** 1211.
See also: Target practice.
Gunnery school, establishment of—
Craven, F. S. We must have it. **244,** 949.
Guns (Ordnance).
Evans, Waldo. Shall we grant superiority to a foreign navy? **248,** 1745.
Miller, H. W. German long-range gun: a bibliography and a description. **250,** 2098.
Analysis of gun ranges. **246,** 1366.
Increase in gun ranges on vessels of the "treaty" navies. **244,** 1048.
16-inch gun era. **249,** 1885.
Description of German "super-gun." **242,** 700.

Guns—Ordnance.—Cont'd
Elevation and range of British and U. S. guns. **247,** 1563.
Extreme elevation not to be made. **245,** 1210.
Gun range controversy. **249,** 1932.
Ranges of turret guns not to be increased (?) **243,** 876.
Sea guns of today. (1923). **249,** 1930.
Testing the *Maryland's* 16-in. gun. **245,** 1210.
Guns (small arms).
Wilson, E. E. Trend in small arms. **250,** 2022.
Gun's crews, training.
Craven, F. S. We must have it. **244,** 949.

H

Haeberle, F. E.
Ship stabilization. **247,** 1451.
Hague, The.
President's message to Senate urging U. S. to join conference, 1923. **243,** 888.
Hains, Paul W.
Protection of capital ships against poison gas. **245,** 1113.
Haiti.
Conrad, Charles. A year in Haiti's customs and fiscal service. **242,** 605.
Helicopters.
DeBothezat helicopter flies with two men. **241,** 510.
Great Britain helicopter competition (1923). **246,** 1364.
Helicopter progress. **248,** 1739.
New kind of helicopter, the Vertipactor. **247,** 1555.
Oehmichen helicopter hovers nine minutes. **247,** 1555.
Helium.
Liquification of helium. **244,** 1038.
"Hermes" (*Brit. aircraft carrier*).
Description.
246, 1340
249, 1887.
Hinds, A. W.
Sea service made easier and more efficient. **245,** 1097.
Holland.
See Netherlands.
Horizon, artificial.
Lackey, H. E. For the want of a wrinkle the ship was lost. **250,** 1997.
Hospitals.
Williams, Dion. A modern field hospital. **245,** 1141.
How to write a scientific article.
Smith, C. A. **245,** 1123.
Hughes, Charles Evans.
(Extracts from) Address on results of Washington naval conference. **241,** 521.

I

Ice seamanship.
Frank Luckel. **239,** 91.
Igniters.
Electric igniters for oil burners. **240,** 346.
Indicators, course and speed.
Willson, Russell. Direct reading course and speed indicator. **248,** 1655.
Industry, war time control of.
F. F. Fletcher. **246,** 1237.
Ingenohl, Admiral von (Ger. Nav.)
German admiral's apologia. **243,** 862.
Insurance.
Adamson, K. F. Discussion of "Life Insurance as applied to the naval service." **243,** 853.
Blackburn, C. K., Discussion of Webb's "Life Insurance and the naval service." **240,** 313.
Cowie, T. J. Discussion of life insurance as applied to the naval service. **241,** 479.
Internal combustion engines.
Cold starting oil engine. (Illus.) **247,** 1530.
Compressorless diesel engine. **246,** 1917.
Diesel engine in 1923. **242,** 693.
Gas turbine. **245,** 1204.
Improvement in diesel motors. **246,** 1527.
The Michel motor. **247,** 1529.
New type of double-acting 4-cycle marine diesel. **247,** 1528.
Navy engineers plan 3,000 h.p. diesel. **244,** 1037.
See also: Aeronautics—motors.
International law.
See Law, international maritime.
International relations.
Bywater, H. C. Europe's politicians insincere. **250,** 2113.
"Iowa" (*U. S. S.*)
Gillette, N. C. End of the Trail. **241,** 915.
Illustrations. **240,** 319.
Sinking of. (Drawing by H. Reuterdahl). **244,** 897.
Ireland.
New constitution adopted. **239,** 195.
Italy.
Facisti movement. **239,** 195.

J

Jackson, John P.
Discussion on employment of aircraft in naval warfare. **239,** 117.

Japan.
The "earthquake cabinet" personnel. **249,** 1902.

Defense
Bywater, H. C. Japan's defense problems. **248,** 1720.

Foreign policy
Japan defends South Sea rule. **248,** 1725.

Foreign relations
Britain's check on Japan. **248,** 1701.
Earthquake "Not a cataclysm." **250,** 2071.

Naval policy
Bywater, H. C. Japan: a sequel to the Washington Conference. **243,** 811.
Bywater, H. C. Japanese policies in the light of disaster. **250,** 2067.

Foreign relations
Singapore naval base and Japanese jingoists. **248,** 1719.

Naval policy
Bywater, H. S. Japan's defense problem. **248,** 1720.
Japan may be willing to extend pact. **245,** 1214.
Japan's good faith as to naval treaties. **249,** 1899.

Navy
Bywater, H. C. Japanese sea power. **247,** 1510.
Comparative data tables for navies of U. S., Great Britain and Japan. **246,** 1372.
Fuel for Jap. Navy to be imported. **239,** 156.
Present state of Jap. cruiser fleet. (1923). **240,** 338.
Quake loss not heavy. **250,** 2072.
Reorganization of. **243,** 863.

Personnel
Reduction of Japanese personnel. **242,** 683.

Program
1923. **238,** 2161.
1923. **240,** 336.

Jayne, J. L.
"A naval Pooh-Bah." (Illus.). **244,** 983.

Job, The.
J. O. Hoffman. **237,** 1915.
Discussion—S. E. Moses. **242,** 664.

Jones, Hilary P.
Abstracts from an address on U. S. defense. **242,** 690.
A just man armed keepeth his house in order. **243,** 759.

K

K-type Brit. submarine.
Propulsion of K type submarines. **240,** 341.

Kava.
Jayne, J. L. A naval "Pooh-Bah." **244,** 995.

Kawakami, K. K.
Reply to Bywater's Bonin Islands charge. **250,** 2070.

Kermode system of oil-firing.
Description. **244,** 1035.

Kessing, O. O.
Why don't they stay in? **246,** 1255.

King, E. J.
Wrinkle or two in handling men. **241,** 427.

King, Joseph.
Photo. **246,** 1319.

Kinkaid, T. C.
Discussion of naval corps, specialization and efficiency. **245,** 1169.

Kite balloons for ship's boats.
Adoption suggested. **249,** 1935.

Knapp, Harry S.
Limitation of armaments. The Conference of Washington. **243,** 767.
Review of Niblack's "Why wars come." **241,** 544.

Knox, Dudley W.
Discussion of "Part of engineering in command." **242,** 663.

Koch, R. A.
Our present naval situation. **240,** 287.

Kun, Tsao.
Elected president of China. **250,** 2127.

L

Lackey, H. E.
For the want of a wrinkle the ship was lost. **250,** 1997.

Lamb, S. G.
Automatic depth recorder as an aid to navigation. **239,** 111.

"Langley" (*U. S. S.*)
Flying practice aboard the *Langley*. **244,** 1039.
Plane takes off from and alights on *Langley*. **239,** 169.

Lasker, Albert D.
Statement regarding merchant marine on retirement as chairman of Shipping Board. **246,** 1354.

Lausanne Conference (1923).
American position stated. **239,** 194.
Allies and Turks reach agreement. **247,** 1581.
Treaty signed. **248,** 1752.
Greeks refuse to pay Turks. **245,** 1230.
Work of the conference. **240,** 373.
Activities of. **241,** 533.
Law, international maritime.
Wainwright, R. Laws and customs of war at sea as affected by the World War. **244,** 897.
Effects of the European War, 1914-18, on international law. **250,** 2116.
Leadership.
Robison, J. K. Part of engineering in command. **240,** 203.
League of Nations.
Kiel canal case before league court. **247,** 1580.
Work of 23d session of council. **242,** 719.
Work of the council at Geneva, April, 1923. **245,** 1231.
"Leviathan" (*S. S.*).
Breaks world speed record. **247,** 1521.
Difficulty of providing docking space. **245,** 1201.
Wins radio records. **247,** 1568.
Illustration. **247,** 1523.
"Lexington" (*U. S. S.*).
Description. **237,** 1967.
See also correction in **243,** 864.
Life saving.
Douglas, S. C. British lifeboat service. (Illus.) **247,** 1473.
Lighthouses.
New apparatus for Port Said. **243,** 878.
Lightning protection.
Anti-lightning equipment for balloons. **243,** 875.
Lightships.
New Nantucket lightship. **249,** 1935.
Limitation of armament.
Bywater, H. C. America not to blame if treaty fails. **244,** 1043.
Knapp, Harry S. Limitation of armament at the conference of Washington. **243,** 767.
British and other fleet reductions. (1923). **240,** 357.
British skeptical about further limitation. **241,** 517.
France and disarmament. **239,** 140.
Further naval limit proposed. **240,** 359.
Warship scrapping. **239,** 135.
Why the navies do not melt away. **240,** 354.
World powers split on armament issue. **249,** 1939.
Limitation of armament.—Cont'd
See also Conference on Limitation of armament.
Logistics.
Anderson, W. S. Strategy and logistics of the Dardanelles campaign. **241,** 1127.
Logs. (speed).
Electric submerged log. **239,** 172.
Lubrication. Theory of lubrication. **241,** 501.
Luckel, Frank.
Ice seamanship. (Illus.). **239,** 91.

M

McCain, J. S.
Personnel survey. **239,** 19.
McIntosh, K. C.
Discussion of proposed amalgamation bill. **245,** 1164.
McClellan, E. N.
American marines in the Revolution. **244,** 957.
How the marine band started. **242,** 581.
The Navy at the battles of Trenton and Princeton. **249,** 1848.
Will history repeat itself? **240,** 201.
Machine guns.
New Browning automatic gun, 1.5 cal. (1923). **246,** 1368.
McNamee, Luke.
Keep our Navy strong. **243,** 801.
Aviation and the Navy. **250,** 2072.
McWhorter, E. D.
Review of Sothern's "Marine diesel engines." **242,** 736.
Magnetos.
New British magneto. **241,** 506.
Mahan, A. T. Smith, R. C. On Stevens' "Scrapping Mahan." **250,** 2111.
"Majestic" (*S. S.*).
Makes record passage. **240,** 341.
Steered by "radio compass." **250,** 2108.
"Malaya" (*H. M. S.*)
Last big British colonial warship. **250,** 2056.
Maneuvers.
Maneuvers of 1924 to be greatest since war. **250,** 2076.
Notes on 1923 fleet maneuvers. **241,** 865.
Summation of fleet maneuvers of 1923. **244,** 1021.
"Marblehead." (*U. S. S.*).
Description. **250,** 2077.
Marine band.
McClellan, E. N. How the marine band started. **242,** 581.

Marine engineering.
Dyson, C. W. Discussion on "Part of engineering in command." **243,** 844.
Esler, J. K. Preparing the engineer department for battle. **245,** 1085.
Foote, P. W. Engineering experience: its value to the captain. **246,** 1243.
Knox, D. W. Discussion of "Part of engineering in command." **242,** 663.
Pratt, W. V. Discussion of "Part of engineering in command." **242,** 661.
Robison, J. K. Part of engineering in command. **240,** 203.
Twining, N. C. Discussion of "Part of engineering in command." **243,** 843.
Wilson, H. B. Discussion of Robison's "Part of engineering in command." **240,** 219.
Air heating by waste gases. **250,** 2092.
Engineer training in British Navy. **247,** 1526.
Geared drive. **250,** 2096.
Marine physics.
Sea-going laboratory urged. **243,** 879.
"Maryland" (*U. S. S.*).
Illustration. **243,** 749.
Memel.
Siezed by Lithuanians. **241,** 534.
Merchant marine. France.
Facing loss, French government sells ships. **247,** 1505.

Germany

German shipping conditions, in 1923. **248,** 1732.

Great Britain

British liners pinched by U. S. competition **248,** 1731.

Italy

Italy's merchant fleet. (1923). **240,** 340.

Japan

Japanese merchant officers' training. **242,** 692.

Sweden

Sweden's merchant fleet. **248,** 1732.

U. S.

Cross, F. E. Merchant marine personnel. **239,** 71.
Green, F. V. Discussion of "Merchant marine personnel." **242,** 669.
American shipping not losing ground (1922). **239,** 158.
America and a place on the high seas. **247,** 1519.
Chairman Lasker advises government operation in retiring letter. **246,** 1354.
Efficient merchant marine vital as a naval reserve. **243,** 868.
Merchant marine.—Cont'd
Jones bill enforcement advocated. **250,** 2077.
Lasker's final recommendations to Shipping Board. **247,** 1518.
Merchant fleet our outstanding need. **245,** 1197.
Object of subsidy. **239,** 157.
Press comments on U. S. merchant marine. **245,** 1198.
School for officers opened at Philadelphia. **239,** 157.
Ship subsidy and the American merchant marine. **239,** 185.
U. S. Merchant vessels in foreign trade —statistical summary. **249,** 1913.
Mercury boiler.
Description. **248,** 1742.
"Messudiyeh" (*Turk battleship*).
Sinking of. **242,** 647.
Meteorology.
Floating weather bureau on the Atlantic. **243,** 877.
Mexico. Foreign relations.
U. S. recognizes Mexico, 1923. **249,** 1950.
Michel motor.
Description. **247,** 1529.
Miller, H. W.
German long range gun. **250,** 2098.
"Milwaukee" (*U. S. S.*).
To measure Pacific depths. **248,** 1750.
Minelayers.
Cruising minelayers. **242,** 675.
Mines.
Ashbrook, A. W. Naval mines. **240,** 303.
Torpedoes and naval mines in the war. **244,** 1016.
"Mississippi" (*U. S. S.*).
Illustration. **243,** 759.
"Mississippi" (*C. S. S.*).
Parks, A. M. Building a war ship in the southern confederacy. **246,** 1299.
Model tank experiments.
Snow, Elliot. Model tank experiments by Benjamin Franklin. **247,** 1469.
Moffett, W. A.
Defense of the dirgible. **244,** 1055.
Review of Raleigh's "War in the air, Vol. 1." **242,** 732.
Mohammed VI, sultan of Turkey.
Deposed. **239,** 193.
"Monitor" (*U. S. S.*).
Green, S. D. *The Monitor* at sea and in battle. **249,** 1839.
Mooring masts.
Portable masts for mooring airships. **246,** 1361.

Morocco.
Niblack, A. P. French Morocco, the colonial miracle. (Letters of a ret'd rear adm.) **240,** 253.
Moses, Stanford E.
Discussion of "The Job." **242,** 664.
Preventive discipline. **247,** 1441.
Motor ships.
Diesel engines in liners. **239,** 164.
French twenty-two thousand ton motor ship. **241,** 501.
Great impetus to motor shipping in 1923. **247,** 1500.
Motorships vs. steamships; comparative statistics. **248,** 1733.
Popularity of motorships among owners. **248,** 1732.
Proposed forty thousand h.p. motorship. **245,** 1202
Twin screw motorship *Crux*. **249,** 1912.
"Mount Vernon" (*S. S.*).
To be reconditioned. **243,** 868.

N

Nantucket lightship.
New lightship on Nantucket shoals. **249,** 1935.
Narutowitz, Gabriel, pres. of Poland.
Assassination of. **240,** 376.
National debts.
British debt settlement terms. **242,** 715.
"Natori" (*Jap. cruiser*).
Explosion aboard. **246,** 1346.
"Nauticus" (*German naval annual*)
Discussion of its purpose and value. **246,** 1344.
Naval administration.
Twining, N. C. Discussion of "Administrative flagship" and a "Fighting leader for the fleet." **243,** 847.
Naval architecture.
Doubts concerning design of new French ships. **245,** 1187.
Future fighting ships,—an impression. **241,** 483.
Naval education.
Bassler, R. E. Education and training of officer personnel. **249,** 1818.
Foote, P. W. Engineering experience: its value to the captain. **246,** 1243.
Training of British naval engineers. **241,** 485.
Naval policy.
Pratt, W. V. Naval policy and world politics. **245,** 1073.
See also: U. S. Naval policy.
Naval Reserve.
See U. S. Naval Reserve.
Naval strategy.
Anderson, W. S. Strategy and logistics of Dardanelles campaign. **245,** 1127.
Belknap, R. R. Study of strategy. **239,** 1.
Frost, H. H. Spirit of the offensive.
Part I—**238,** 2089.
Part II—**239,** 97.
Part III—**240,** 269.
Phelps, W. W. Discussion of "Spirit of the offensive." **244,** 1006.
Schofield, F. H. Incidents and present day aspects of naval strategy. **243,** 777.
Voïtoux, G. New weapons and old ones. **248,** 1635.
American naval strategy. **245,** 1195.
Enemies of the battleship. **248,** 1714.
Influence of air reconnaissance on strategy and tactics. **240,** 362.
Strategical importance of bases and ships. **247,** 1498.
Naval tactics.
Wainwright, L. Discussion of "Art of ship control." **245,** 1173.
Willson, Russell. Our tactical readiness for war. **242,** 553.
Naval training.
Scammell, J. M. Early indoctrination of new recruits. **247,** 1447.
Naval War College.
See U. S. Naval War College.
Navies.
Comparative statistics, U. S., Great Britain, and Japan, 1923. **241,** 519.
Personnel of world's navies—(1922). **247,** 1576.
The two greatest fleets (1923). **248,** 1728.
World's navies in 1923. **245,** 1217.
Navigation.
Downes, John. Navigation vs. the junior naval officer. **241,** 469.
Green, Fitzhugh. Earth features and the navy pilot. (Illus.) **249,** 1773.
Naylor, W. K.
Review of Knox, A., With the Russian army, 1914-17. **244,** 1067.
Netherlands. Navy.
Dutch navy bill, 1923. **250,** 2116.
Dutch naval policy, 1923. **249,** 1939.
Naval program, 1923. **248,** 1753.
Neutrality.
Wainwright, R. Removal of passengers from neutral vessels. **244,** 908.
"New Jersey" (*U. S. S.*).
Grow, H. B. Bombing tests on the *Virginia* and *New Jersey*. **250,** 1987.

Niblack, A. P.
Athletics, beneficial and otherwise. **248,** 1609.
Barbary pirates, Algeria, etc. (Letters of a retired rear admiral) (Map). **242,** 571.
Colonial possessions of France. (Letters of a ret'd rear adm.) **240,** 261.
French finances, culture, etc. (Letters of a retired rear admiral.) **241,** 435.
French Morocco, the colonial miracle. (Letters of a ret'd rear adm.) (Map). **240,** 253.
Review of Satow's guide to diplomatic practice. **247,** 1585.
Nicaraguan canal.
Cost of proposed canal. **242,** 706.
Negotiations for route. **242,** 719.
Nielson, J. L.
Athletics. **247,** 1431.
Last cruise of the *UB-88*. **246,** 1275.

O

Oceanography.
Photographing the ocean's depths. **247,** 1568.
Two-mile lift in ocean bed in South Atlantic. **249,** 1941.
Off-shore gull.
E. B. Underwood. **246,** 1317.
Oil.
Barge for separating oil from surface water. **242,** 697.
Oil burners.
Kermode system. **244,** 1035.
"Omaha" (*U.S.S.*).
Illustration. **243,** 767.
Illustration and description. **242,** 687.
Ordnance.
See Guns (ordnance).
Organization.
Esler, J. K. Suggestion regarding battleship organization. **249,** 1805.
Twining, N. C. Discussion of "Principles of high command." **244,** 1003.

P

Pacific Mail S. S. Co.
New P. M. motorships. **247,** 1525.
Page, Thomas Jefferson.
Autobiographic sketch. **248,** 1661.
Pago Pago harbor.
Photo of entrance. **244,** 989.
Paint.
Vessel's bottom o.k. after thirteen years in water. **249,** 1942.
Panama canal.
Air defenses discussed. **247,** 1560.
Canal pays for itself many times over. **249,** 1941.
Panama canal.—Cont'd
Defenses of the canal (1923). **247,** 1515.
Naval danger at Panama. **244,** 1026.
Tolls, 1922-23. **242,** 707.
Well-defined weaknesses of Panama canal. **245,** 1193.
Pan-American Conference, 1923.
5th Conference at Santiago. **243,** 889.
Naval limitation proposed. **246,** 1342.
Results of. **245,** 1232.
South American, Russian and Italian armaments. **246,** 1381.
Paraguay. Revolution, 1923.
Bombardment of rebels. **247,** 1573.
Parker, Thomas D.
Evidence. **242,** 643.
Parks, W. M.
Building a warship in the southern confederacy. **246,** 1299.
"Pelikaan" (*ship*).
Diesel electric ship *Pelikaan*. **240,** 344.
"Penguin" (*U.S.S.*).
Placed in commission. **250,** 2076.
Peppermint oil.
Used as gas mask test. **241,** 511.
Phelps, W. W.
Discussion of "Spirit of the offensive." **244,** 1006.
Philadelphia Navy Yard.
Photo showing decommissioned destroyers, 1922. **241,** 449.
Philippine Islands.
Opposition to Gen. Wood. **250,** 2125.
Opposition to Philippine independence scored in Tokio. **248,** 1725.
Photography.
Aerial photographic laboratory on *ZR-1* **248,** 1741.
Growth of aerial photography. **248,** 1740.
Physical training.
Niblack, A. P. Athletics, beneficial and otherwise. **248,** 1609.
See also: Athletics.
"Pigeon" (*U.S.S.*).
Placed in commission. **250,** 2076.
Pirates.
Niblack, A. P. Barbary pirates, Algeria, etc. **242,** 571.
Pistol training.
Baum, G. M. Common sense training with the service pistol. **246,** 1309.
Wilson, E. E. Discussion of "Training with service pistol." **248,** 1697.
Planning and estimating at navy yards.
G. H. Rock. **244,** 969.
Poison gas warfare.
See Gas Warfare.

Polar exploration.
Green, Fitzhugh. Across the pole by plane. **244,** 937.
Porter, David Dixon.
Portrait. **248,** 1601.
"Porter" (*U.S.S.*).
Illus. during heavy sea. **240,** 243.
Port Said.
Improvements at. **243,** 856, 878.
"Poughkeepsie" (*ferry-boat*).
Electric ferry boat *Poughkeepsie.* **242,** 696.
Powder.
See Explosives.
Power, transmission of.
Wave transmission of power. **239,** 166.
Pratt, W. V.
Discussion of "Part of engineering in command." **242,** 661.
Naval policy and—world politics. **245,** 1073.
Review of Gibbons' "Introduction to World Politics." **242,** 721.
"President Buchanan" (*S.S.*).
To be reconditioned. **243,** 868.
Preventive discipline.
S. E. Moses. **247,** 1441.
Princeton, battle of.
McClellan, E. N. The navy at the battles of Trenton and Princeton. **249,** 1848.
"Proceedings," U. S. Nav. Inst. Cost of issuing. **250,** 2133.
Propellers.
Contra propellers. **241,** 506.
Enamelled propellers resist corrosion. **240,** 343.
Gill propeller. **250,** 2088.
New patent propeller device. **249,** 1916.
Protection against racing. **244,** 1036.
Protection against underwater attack.
T. L. Schumacher. **246,** 1261.
Publicity.
Wharton, W. S. Taking the navy to the people. **250,** 2010.
Pulitzer race. 1923.
Won by A. J. Williams. **250,** 2087.
Pumps.
New type deep well pump (Illus.) **245,** 1545.
New type pump for semi-diesels. (Illus.) **239,** 163.
Purdy, Gilbert H.
Photo. **246,** 1237.

R

Radio.
Bullard, W. H. G. Radio situation in U. S., 1923. **248,** 1622.
Radio.—Cont'd
Fighting aircraft with radio. **248,** 1368.
France forging ahead in radio facilities. **246,** 1370.
Frequency measurement in radio. **248,** 1751.
High speed radio apparatus. **250,** 2107.
Illustration of loop collectors and antenna at Navy Dept. Station. **239,** 131.
Note filters. **250,** 2108.
Teaching radio to sleeping students. **248,** 1750.
"Wave length" or "Kilo cycle?" **249,** 1938.
Wireless beam stations. **250,** 2108.
"Wireless lighthouse" installation on Inchkeith. **241,** 513.
Radio compass stations.
Summary of activity (1922). **239,** 172.
Radio control of ships.
New radio control on battleships. **245,** 1212.
Radiotelegraphy
New telegraph alphabet. **245,** 1212.
Radiotelephony.
Privacy secured in wireless telephone. **246,** 1369.
Duplex method perfected. **250.**
Ramsey, DeWitt C.
Development of aviation in the fleet. **247,** 1395.
Ranges of guns.
See Guns (ordnance).
Records.
Goodrich, C. F. The Navy's paper work. **241,** 465.
Goodrich, C. F. Discussion of "Navy's paper work" (letter). **246,** 1323.
Recruits and recruiting.
Graham, S. V. Discussion on "Why don't they stay in?" **250,** 2048.
Kessing, O. O. Why don't they stay in? **246,** 1255.
Scammell, J. M. Early indoctrination of new recruits. **247,** 1447.
Reeves, J. W.
Discussion of "Naval policy of U. S. in the Pacific." **244,** 1006.
Refitting.
Naval treaty to govern refitting. **249,** 687.
Reparations.
See European War, 1914-18. *Indemnity.*
Retirement.
See U. S. Navy—Promotion and pay.

Rhine Army Conference.
Unable to reach settlement. **245,** 1229.
Rittenhouse, David.
Wins Schneider cup race, 1923. **250,** 2086.
Riveting.
Combined riveting and welding. **247,** 1546.
Robison, John K.
Part of engineering in command. **240,** 203.
Rock, G. H.
Planning and estimating at navy yards. **244,** 969.
Rogers, R. E.
Review of Cedee's Nautical tables. **245,** 1233.
Roop, W. P.
Naval policy of the U. S. in the Pacific. **241,** 409.
Roosevelt, Theodore.
Maintenance of the treaty navy. **243,** 739.
Rudders. Flettner rudder on the *Odenwald*. **247,** 1533.
Ruhr district, Germany.
Extension of French control. **242,** 713.
France in the Ruhr. **243,** 886.
French occupation of. **241,** 531.
Significant events in the Ruhr (1923). **250,** 2064.
Reparations and the Ruhr. **245,** 1229.
Russell, Charles F.
Co-ordinators—Who? What? Why? **250,** 2035.
Russia.
Foreign affairs
No American recognition. **243,** 887.
History
New soviet constitution. **248,** 1762.
Navy
Russian naval plans (1923). **249,** 1938.

S

Salute.
Salute and speak. **243,** 883.
Salvage operations.
Davison, R., and Royce, D. Salvage of the U.S.S. *Allegheny*. (Illus.) **242,** 631.
Refloating the *France*. **249,** 1896.
Scapa Flow ships to be salvaged. **247,** 1499.
Submarine tractor to raise wreckage. (Illus.) **247,** 1570.
Samoa.
Jayne, J. L. A naval "Pooh-Bah." **244,** 983.
"Saratoga" (*U.S.S.*).
Illustration. **237,** 1845.
See also: correction in: **243,** 864.
"Saturn" (*U.S.S.*).
Luckel, Frank. Ice seamanship. (Illus.) **239,** 91.
Savage, F. A.
Discussion on "Does the navy need a Naval Reserve Force?" **250,** 2048.
Scammell, J. M.
Early indoctrination of new recruits. **247,** 1447.
Program for Naval history. **232,** 973.
Addenda: **240,** 315.
See also: Woods, R. H. (Discussion of same).
Scapa Flow.
Salvage operations to begin on German vessels. **247,** 1499.
Schneider cup race, 1923.
Won by U. S. aviator, David Rittenhouse. **250,** 2086.
Schofield, Frank H.
Incidents and present day aspects of naval strategy. **243,** 777.
Schumacher, T. L.
Protection against underwater attack. **246,** 1261.
Scott, Sir Percy.
Says proposed Singapore base is foolish. **250,** 2054.
Sea service made easier and more efficient.
A. W. Hinds. **245,** 1097.
Seamanship.
Stiles, W. C. I. Art of ship control. **242,** 587.
Seamen.
American and foreign seamen. **240,** 340.
Searles, P. J.
On the origin of war. **249,** 1858.
"Seattle" (*U.S. cruiser*).
To be U. S. fleet flagship. **242,** 689.
Seismic disturbances.
Submarine eruption in South China sea, 1923. **250,** 2106.
Two-mile lift in South Atlantic bed. **249,** 1941.
Selection.
See U. S. Navy *Promotion and Pay*.
Shanghai, China.
U. S. radio station at Shanghai. **248,** 1751.
Shantung.
China resumes control. **240,** 377.

Shaw, J. B.
Electric vs. geared drive. **247,** 1536.
"Shenandoah" (*U.S. airship*).
See Z R-1.
Shipbuilding.
U. S. takes 6th place in shipbuilding. **250,** 2080.
World's shipbuilding, 1923. **250,** 2080.
Construction statistics for German's yards, 1923. **249,** 1913.
British yards and foreign navies. **240,** 323.
Record German shipbuilding, (1923). **242,** 682.
Ship control, art of.
W. C. I. Stiles. **242,** 587.
Sims, W. S.
Admiral Sims on submarines in the war. **246,** 1373.
Singapore naval base.
Britain's great naval base (with map). **247,** 1517.
Britain to have 11 million dollar naval base. **245,** 1179.
British base at Singapore. **243,** 857.
Characterized as foolish proposal by Sir Percy Scott. **250,** 2054.
Cost, and description of dock. **249,** 1889.
Cost. **247,** 1498.
Is France anxious about Singapore? **249,** 1891.
"Threat to Japan." **249,** 1888.
Slawson, Paul S.
Discussion on "Naval gunnery school." **249,** 1875.
Slee, J. A.
Improvements in radio (1923). **250,** 2107.
Slide rule.
Airship slide rule. **248,** 1739.
Small arms.
See Guns (small arms).
Smith, Charles Alphonso.
How to write a scientific article. **245,** 1123.
Smith, Oscar.
Back to normalcy with amalgamation. **250,** 2030.
Smith, Roy C.
On Stevens' "Scrapping Mahan," **250,** 2111.
Smith, Roy C. Jr.
Fifty years of service. **248,** 1601.
Review of Bullen's "Frank Brown." **246,** 1391.
Smoke screen.
Illustration of. **245,** 1073.
Illustration of plane laying smoke screen. **246,** 1363.
Snow, Elliot.
Discussion of proposed amalgamation bill. **245,** 1163.
Discussion on naval corps, etc. **250,** 120.
Model tank experiments by Benj. Franklin. **247,** 1469.
Origin of watertight compartments. **242,** 601.
Review of Pounder's "Machinery and pipe arrangement on ship board." **239,** 199.
"S.O.S." call (radio).
Substitute for "S.O.S." suggested. **249,** 1936.
Soundings.
Hannibal to survey Cuban gulf. **242,** 701.
Lamb, S. G. Automatic depth recorder. **239,** 111.
Pacific depths to be measured. **240,** 1750.
Possibilities of the marimeter. **239,** 173.
Sonic depth finder to be tried by new cruiser. **247,** 1567.
Sonic survey of west coast of U. S. **241,** 512.
To test new sounding device in Pacific. **240,** 352.
U.S.S. *Denver's* important mission in Central American waters. **244,** 104
Spain.
Military coup d' état establishes dictatorship. **249,** 1948.
Spence, Robert T.
Personal letter of, regarding incident of Tripolitan War, 1804. **242,** 62
Sports.
Nielson, J. L. Athletics. **247,** 14
Stabilization of ships.
Haeberle, F. E. Ship stabilization. **247,** 1450.
Stabilizers.
Sperigyro stabilizer for British admiralty. **249,** 1891.
Static.
Prevention of. **242,** 701.
Steam pressure.
Steam at 3,000 lbs. pressure. **240,** 1527.
Steam at 3,200 lbs. pressure. **248,** 174
Steering.
Automatic steering. **240,** 354.
Stevens, William O.
Review of Beach's "Dan Quin of the Navy." **239,** 201.
Stiles, W. C. I.
Art of ship control. **242,** 587.

Stokers, mechanical.
Description and efficiency of mechanical stokers. **246,** 1358.
Submarine boats.
Nielson, J. L. Last cruise of the *UB-88*. **246,** 1275.
Britain's mystery submarine (1923). **247,** 1495.
British sub. to be largest afloat (1923). **245,** 1177.
Further details of *X-1* (largest, 1923). **246,** 1339.
Ocean-going submarines of world's navies. **246,** 1376.
Propulsion of submarines. **240,** 341.
Submarine dangers lessened. **247,** 1500.
Submarines and the British Navy. **240,** 319.
Submersible battleships. **242,** 677.
War production of submarines at Germania yard. **245,** 1187.
Accidents.
Fatal explosion aboard Japanese *No. 75*. **246,** 1347.
Submarine tenders.
Illustration of 3 submarine tenders and submarines at Balboa. **243,** 855.
Submarine warfare.
Bywater, H. C. On submarine warfare. **246,** 1373.
Castex, Captain. *La guerre sous-marine* (book review). **249,** 1852.
Schumacher, T. L. Protection against underwater attack. **246,** 1261.

T

Takarabe, Hyo.
Japan's new naval chief. **247,** 1513.
Tanks. (military).
Amphibious army tank. **240,** 352.
Target practice.
Another target ship for gunnery experiments. **249,** 1911.
Anti-aircraft practice. **240,** 351.
200 hits in a row at 500 yards. **249,** 1932.
U. S. fleet battle practice, 1923. **241,** 511.
Taussig, J. K.
Answer is 135,000 men. **248,** 1643.
Destroyer experiences during the Great War.
Part I—**238,** 2015.
Part II—**239,** 39.
Part III—**240,** 221.
Part IV—**241,** 383.
"T.C.-1" (*U.S. airship*).
Destruction of. **246,** 1363.
"T.C. 2" (*Dirigible plane-carrier*).
Description. **245,** 1209.
Territorial limits.
See: Three-mile territorial limit.
Thorpe, George C.
Review of Buells "Washington Conference." **242,** 732.
Three-mile territorial limit.
British refuse to extend three-mile limit to twelve. **247,** 1579.
British view of. **248,** 1758.
Proposed extension of. **246,** 1389.
Tift brothers.
Parks, W. M. Building a warship in the southern confederacy. **246,** 1299.
Tilley, B. F.
Handling 117 de-commissioned destroyers. **245,** 1105.
Tinker, Clifford A.
Airships a necessity for U. S. **245,** 1223. **249,** 1926.
Tisdale, Mahlon S.
Editorial from Baltimore *Sun* on "Naval Academy of today." **249,** 1876.
Naval Academy of today and its mission. **241,** 453.
Torpedo boats.
Torpedo craft strength of the chief powers. **239,** 179.
Torpedo planes.
Bolts from the blue. **247,** 1558.
British torpedo flying boat. **244,** 1038.
French torpedo plane a success. **248,** 1716.
Illustration of modern torpedo plane. **244,** 1011.
Torpedoes.
Japanese torpedoes (1923). **243,** 863.
Torpedoes and naval mines in the war. **244,** 1016.
Treaties.
Lausanne treaty with Turkey signed (1923). **248,** 1752.
See also: Conference on Limitation of Armament.
Trenton, Battle of.
McClellan, E. N. The Navy at the battles of Trenton and Princeton. **249,** 1848.
Trial trips.
Necessity of for passenger liners. **246,** 1357.
Tripolitan War.
Spence, R. T. Personal letter of. **242,** 625.
Tsao Kun.
See Kun, Tsao.
Tubing.
Stainless steel tubing. **240,** 343.

"Tucker" (*U.S.S.*).
Illustration of detail. **240,** 239.
Tunis.
Niblack, A. P. Barbary pirates, Algeria, Tunisia, etc. **242,** 571.
Turkey.
Nationalist party assumes power. (1922). **239,** 193.
Turrets.
British triple turrets. **249,** 1885.
Results of value tests (1923). **246,** 1342.
Twelve-mile territorial limit.
See Three mile territorial limit.
Twining N. C.
Discussion of "Administrative flagship," and "Fighting leader for the fleet." **243,** 847.
Discussion of "Part of engineering in Command." **243,** 843.
Discussion of "Principles of high command." **244,** 1003.
Discussion of proposed amalgamation bill. **245,** 1157.
Review of Chatterton's *Q*-ships. **241,** 537.
"Twin Ports" (*Diesel electric ship*).
Maiden trip a success. **250,** 2079.

U

"UB-88" (*Ex-Ger. submarine*).
Nielson, J. L. Last cruise of the *UB-88*. **246,** 1275.
Underwood, E. B.
Off-shore gull. (Illus.). **246,** 1317.
U. S. Army.
Bassler, R. E. Education and training of officer personnel. **249,** 1818.
U. S. Army of Occupation (Germany).
Costs of army to be paid by Germany (1923). **246,** 1389.
U. S. Commerce.
Growth of oversea trade (1923). **246,** 1356.
U. S. Foreign relations.
Agreement with Mexico looks toward resumption of diplomatic relations. **248,** 1758.
Cancellation of Lansing-Ishii agreement. **244,** 1061.
Japanese tests of American sincerity. **246,** 1353.
Mexico recognized, 1923. **249,** 1950.
U. S. and a world court. **244,** 1061.
U. S. History. *Revolutionary War.*
McClellan, E. N. American marines in the Revolution. **244,** 957.
Civil War.
Goodrich, C. F. Farragut. **250.**
U. S. Marine Corps.
McClellan, E. N. American marines in the Revolution. **244,** 957.
U. S. National Guard.
Report of committee on strength of. **242,** 689.
U. S. Naval Academy.
Baltimore *Sun*. Editorial on Tisdale's "Naval Academy of today." **249,** 1876.
Tisdale, M. H. Naval Academy of today and its mission. **241,** 453.
U. S. Naval administration.
McClellan, E. N. Will history repeat itself? **240,** 249.
U. S. Naval policy.
Bywater, H. C. U. S. Navy can help keep Asia quiet. **243,** 879.
Coontz, R. E. The Navy. **243,** 747.
Jones, H. P. A just man armed keepeth his house in order. **243,** 759.
Koch, R. A. Our present naval situation. **240,** 287.
McNamee, Luke. Keep our Navy strong. **243,** 801.
Roop, W. P. Naval policy of U.S. in the Pacific. **241,** 409.
Roosevelt, J. Maintenance of the treaty Navy. **243,** 739.
Schofield, F. H. Incidents and present day aspects of naval strategy. **243,** 777.
Taussig, J. K. Answer is 135,000 men. **248,** 1643.
America's outpost in the Pacific (Rodman Board recommendations). **241,** 496.
Cabinet and the naval situation (1923). **244,** 1052.
Effect of arms conference on U.S. naval policy. **249,** 1904.
Sidelights on American naval policy. **244,** 1027.
Statement of a definite naval policy. **240,** 333.
U. S. naval expansion not feared by British. **246,** 1370.
See also U.S. Navy yards and bases.
U.S. Naval Reserve.
Bogush, H. R. Does the Navy need a naval reserve force? **247,** 1419.
Savage, F. A. Discussion on "Does the Navy need a Naval Reserve Force?" **250,** 2048.
U.S. Naval War College.
Tentative plans for War College courses. **241,** 494.
U.S. Navy.
Coontz, R. E., The Navy. **243,** 747.

U.S. Navy.—Cont'd
Gardiner, W. H., What the U.S. Navy costs and who pays for it. **243,** 828.
Wharton, W. S. Taking the Navy to the people. **250,** 2010.
Willson, Russell. Our tactical readiness for war. **242,** 553.
Comparative data tables, U.S., Great Britain and Japanese navies (1923). **246,** 1372.
Crippled fleets (1923). **240,** 324.
Modernization of U.S. battleships. **244,** 1048.
Weakness in our Navy (1923). **240,** 360.

General Board
Study of comparative merits of aircraft vs. the battleship (1923). **246,** 1377.

History
McClellan, E. N. The Navy at the battles of Trenton and Princeton. **249,** 1848.

Organization
The Navy unified. **240,** 331.

Personnel
Armknecht, R. F. The average naval officer—an estimate. **250,** 2040.
Bassler, R. E. Education and training of officer personnel. **249,** 1818.
Fisher, C. W. Amalgamation of corps. **244,** 919.
Kinkaid, T. C. Discussion of naval corps, specialization, and efficiency. **245,** 1169.
McCain, J. S. Personnel survey. **239,** 19.
Snow, Elliot. Discussion on naval corps, etc. **239,** 120.
Personnel strength, September 1923. **248,** 1727.
See also: Amalgamation of corps.

Program
1920, **203,** 120.
1920, **207,** 764.
1921, **223,** 1445.
1923, **246,** 1351.
1923, **239,** 152
1924, **248,** 1727.

Promotion and Pay
Babbit, H.S. Proposed modification for the personnel selection law. **244,** 965.

U.S. Navy.—Cont'd
Craven, F. S. Discussion on personnel selection law. **247,** 1493.
Doyle, W. E. Selection and graded retirement. **250,** 1999.

Vessels Building
January, 1923, **242,** 684.
May, 1923, **246,** 1348.
October, 1923, **247,** 1513.
September, 1923, **250,** 2075.

U.S. Navy Department
McClellan, E. N. Will history repeat itself? **240,** 249.

U.S. Navy yards and bases.
Rock, G. H. Planning and estimating at navy yards. **244,** 969.
Program for development. **248,** 1729.
Six fleet bases selected by Navy. **243,** 865.
U.S. Naval base plans. **249,** 1906.

U.S. Shipping Board
Invites bids on ships. **245,** 1197.
New Shipping Board policy (1923). **244,** 1029.
Sale of seven ships of 502 type. **249,** 1914.

U.S. Naval Institute.
Smith, R. C. Fifty years of service. **248,** 1601.
Balance sheet, December 31, 1922. **241,** 549.
Minutes of annual meeting, 1923. **250,** 2129.

"Utah" (*U.S.S.*).
Illustration of U.S.S. *Utah* in Panama Canal. **241,** 383.

V

Vacuum tubes.
Million watt vacuum tube. **239,** 171.

Vincent, J. C.
New Packard Model 1551, 300 h.p. airship engine. **247,** 1545.

"Virginia" (*U.S.S.*).
Grow, H. B. Bombing tests on the *Virginia* and *New Jersey*. **250,** 1987.

Visit and search.
Wainwright, R. Right of visit and search. **244,** 901.

Voitoux, Gabriel.
New weapons and old ones. **248,** 1635.

Volcanoes.
See Seismic disturbances.

W

"Wadsworth" (*U.S.S.*).
Illustration. **240,** 233.

"Wadsworth."—Cont'd
Illustration of *Wadsworth* at Queenstown. **239,** 45.
Wainwright, L.
Discussion on "Art of ship control." **245,** 1173.
Wainwright, Richard.
Laws and customs at sea as affected by the World War. **244,** 897.
Wallace, H. G. S.
Review of Jane's Fighting Ships, 1922. **244,** 1070.
War.
Searles, P. J. On the origin of war. **249,** 1858.
War-time control of industry.
F. F. Fletcher. **246,** 1237.
Washington Conference on Limitation of Armament.
See Conference on Limitation of Armament.
Water, fresh, for vessels.
Fresh water requirements of liners. **249,** 1911.
Watertight compartments, origin of.
Elliot Snow. **242,** 601.
Weems, P. V. H.
Decommissioning destroyers at Philadelphia. **241,** 449.
Welding.
Combined riveting and welding. **247,** 1546.
Process for welding nickle and alloys. **246,** 1358.
Wellman, Walter.
Attempt to cross the pole by air. **244,** 940.
Westcott, Allen F., ed.
Letter of Robt. T. Spence, U.S.N. regarding incident of Tripolitan War. **242,** 625.
Review of Bernotti's *Guerra Marittima*, Volume I. **243,** 892.
Westcott, Allen F.—cont'd
Review of Douin's *Campagne de Vruix*, 1799. **248,** 1766.
Wharton, Wallace S.
Taking the Navy to the people. **250,** 2010.
Why don't they stay in?
O. O. Kessing. **246,** 1255.
Williams, A. J.
Wins Pulitzer race, 1923. **250,** 2087.
Williams, Dion.
Modern field hospital. **245,** 1141.
Willson, Russell.
Direct reading course and speed indicators. **248,** 1655.
Our tactical readiness for war. **242,** 553.
Wilson, E. E.
Discussion of "Training with service pistol." **248,** 1697.
Trend in small arms. **250,** 2022.
Wilson, Henry B.
Discussion of Robison's "engineering in command." **240,** 219.

X

"X-1" (*British submarine*).
Further details of construction, etc. **246,** 1339.

Z

"ZR-1" (*U.S. airship*).
Description. **249,** 1929.
Christening of *ZR-1* as *Shenandoah*. **250,** 2088.
Illustration of gas cell of. **242,** 673
Illustration. **250,** 2053.
Successful flight of. **250,** 2082.
"ZR-3" (*World's largest airship*). Description. **250,** 2084.

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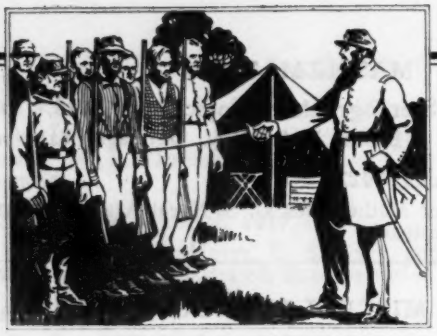

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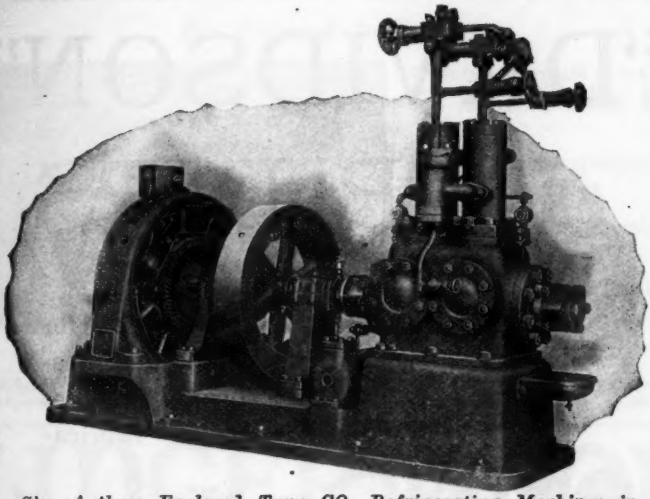

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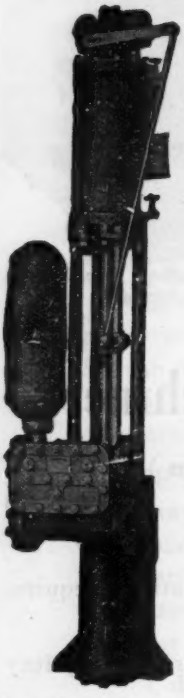

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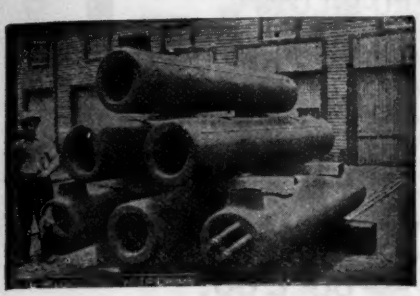

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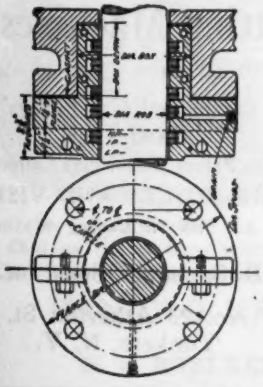

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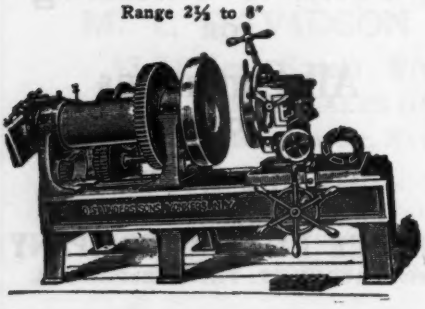

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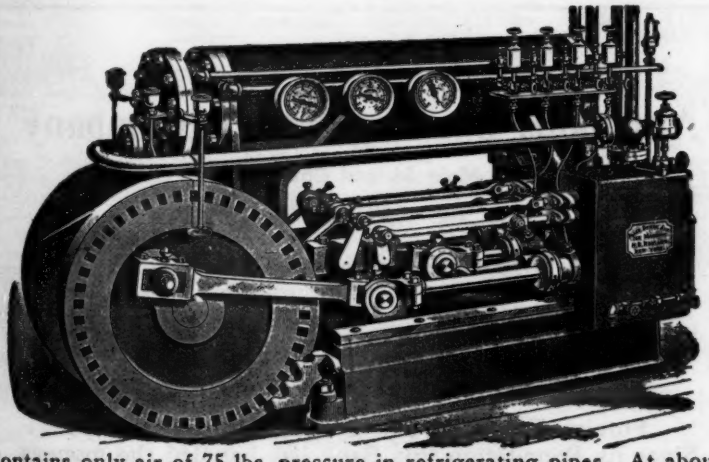

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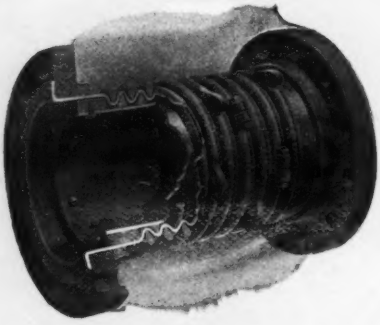

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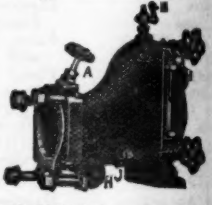

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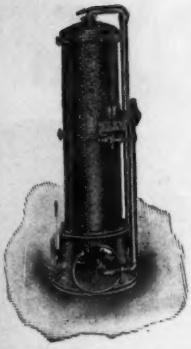

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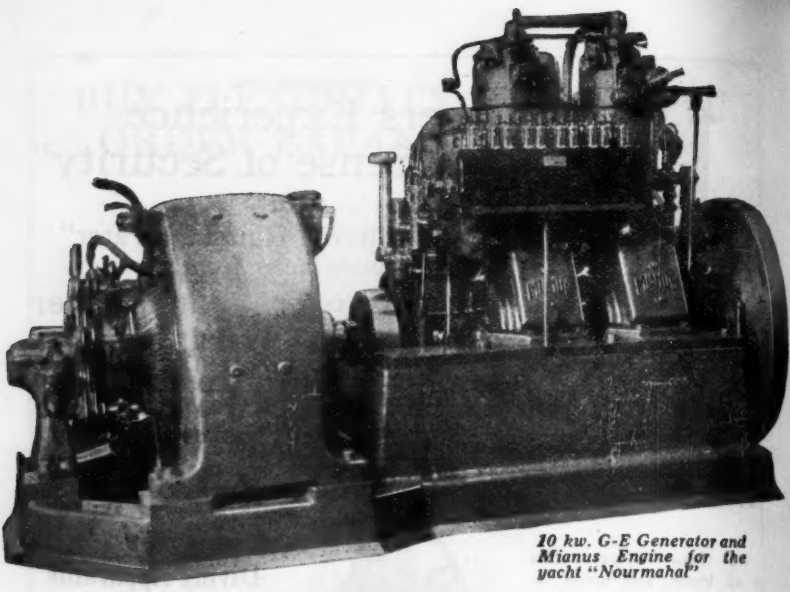

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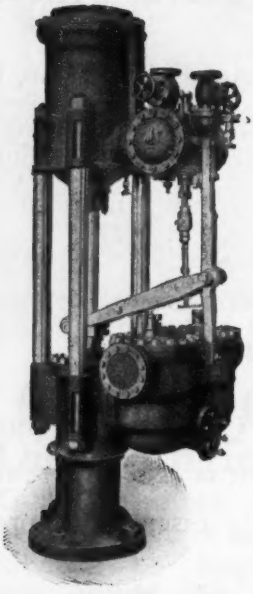

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